THE HEATING AND VENTILATING MAGAZINE

1123 BROADWAY NEW YORK JULY, 1904

HEATING AND VENTILATING IN EARLY DAYS

BY E. P. BUFFET

II—Greenhouse Heating*

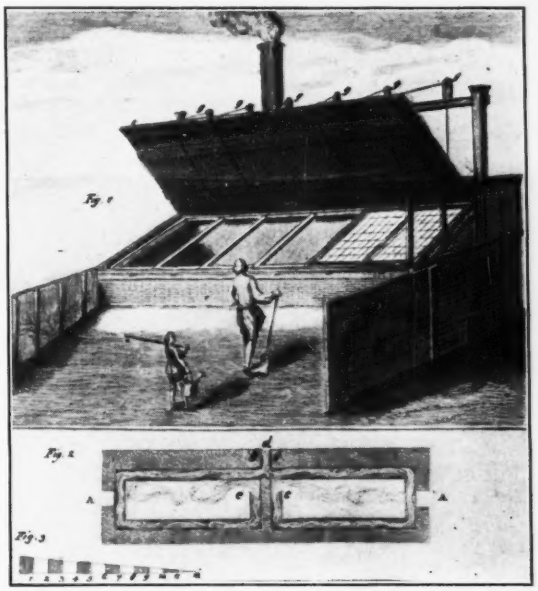
The art of hot house gardening is by no means a new one, which is proved by the two accompanying plates dating back more than 150 years. It will be perceived that, in default of steam heat, recourse was had to furnaces with flues built into the greenhouse walls.

The first illustration represents a method of cultivating ananas and other exotics. By way of describing it, I will adhere closely to the language of the old writer.

The best method of constructing hot beds for exotics is to build them in a right line and place behind them, or to the northwards, bins, to receive in the winter such plants which are in pots, etc., and which would not otherwise be proof against a piercing winter, that by this means they may be heated by one and the same stove. It is also advisable to build behind them a lodge for covering the two repositories; the partition wall must contain the tubes for the transmission of the heat, which must be conveyed through the upper part of the lodge.

The plate annexed represents a hot bed for ananas and other exotics, constructed after this manner, which in the spring is heated by fire, and afterwards by tan or dung. This ought to be built in proportion to the representation; it is in oblique or shelving position. To the northward is a wall of two bricks' thickness, the other parts one brick and a half. Fig. 1 shows its dimensions. The glasses which cover it are 6 feet high, 3½ broad, rising 5½ inches every foot in its oblique position, as shown in Fig. 3.

In the north or hinder wall are



GREENHOUSE HEATING. PLATE I

vents for the rarified air, one behind each shutter, which may all, or any one of them, be stopped as occasion requires. These vents, or apertures, are 2½ inches square for the more speedy elimination of noxious exhalations. The hole on both sides (as *a*, Fig. 1) for removing the ashes is in breadth 1½ feet and 1 foot in height.

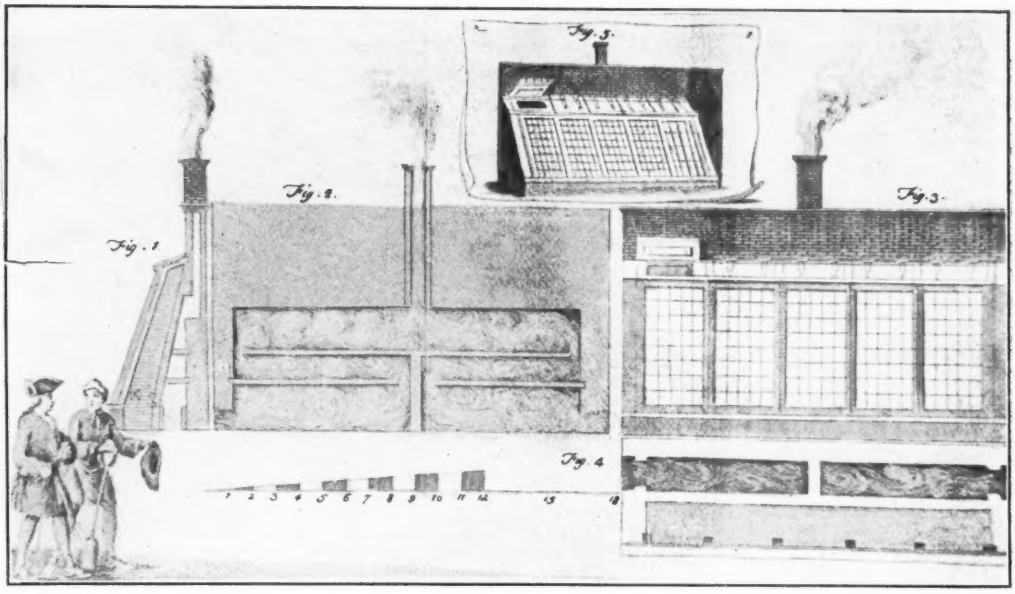
*Based on *Universal Magazine*, March and May, 1751.

In Fig. 2, AA is the hole on the two sides where the fire is made, *bb* the top of the vault on each side, over the partition of the stove, from one wall to the other, at the end of which, in one of the corners, is an aperture winding towards the chimney through which the smoke passes to the passages on the two sides *cc*. These passages on each side for the smoke unite in the center of the work at *d*, where the smoke coming from each side issues through the chimney. This stove is placed in the middle wall above mentioned, or that which separates the bed from the bin.

with an iron plate covered with a sufficient quantity of sand.

Another greenhouse for vine cultivation is described by the same writer in a later number of the magazine. He tells us that vines which are to be forwarded by fire, or by the heat of the sun through glasses, must be planted within the vine house, but allowing them full scope to strike their roots into the common earth. The construction of these vine houses is exhibited in the plate annexed.

Fig. 1 shows the back with the pipe or conduit crossing it for the smoke



GREENHOUSE HEATING. PLATE 2

In order to maintain the fire at an adequate degree, not only proper fuel, with the skill of employing it so as not to deviate from a proper degree of heat, are required, but an eye must also continually be had to the burning of the stove, where the fuel, by being heaped up to the top, may produce terrible effects if it is not moderated by means of a vent on the forepart, through which the ashes fall, and by which more or less air is transmitted into it. Or to prevent any bad consequence, the fire should be moderated by a sufficient quantity of sand; and likewise by keeping constantly the stove closed at the top

of a vine house, of five glass frames artificially heated by a fire on both sides. Fig. 2 is the back with the three pipes for the smoke across (the two lowermost of which are bricked) with the hinder wall and the chimney. Fig. 3 is the front of the vine house. Fig. 4 is the perpendicular profile of the wall, and the little double wall, with the first smoke-pipe and the earth in the vine house contiguous to that without. Fig. 5 is a perspective view of the vine house.

This draught may also serve for vine houses of four glass frames, and three tubes for the smoke, where fire is designed only for one side.

NATIONAL ASSOCIATION OF MASTER STEAM AND HOT WATER FITTERS

WHO HELPS ME I HELP

Blue skies, golden sunshine and foaming surf occasionally unite to gladden the eye, but never was there a more perfect combination than was found by the master fitters at the city by the sea last month. It was the sixteenth annual convention of the National Association of Master Steam and Hot Water Fitters, and the place of meeting was the St. Charles Hotel, Atlantic City, N. J.

The arrivals began in a small way on Saturday, and there was a goodly showing on Monday, which day was devoted to committee work.

In the evening the Philadelphia association gave a dinner at the Raleigh to the Pennsylvania State Association and the officers of the National Association. E. D. Hornbrook, of Kansas City, president of the Master Plumbers' National Association, and C. E. Hasey, of Minneapolis, were also present as guests of honor. Toastmaster P. Gormly brought out a series of interesting little speeches on the general theme of organized effort and suggestions as to the special line which the work of the coming convention should follow.

TUESDAY MORNING SESSION

Henry L. Hall, national president, called the convention to order at 10:30 a. m., Tuesday, June 14, and announced the appointment of the following

COMMITTEE ON CREDENTIALS

A. E. Kenrick, chairman, Brookline, Mass.; E. J. Febrey, Washington, D. C.; G. J. Mast, Indianapolis, Ind.; E. B. Denny, Newark, N. J.; Frank Dobson, New York City; Albert N. Chambers, New York.

A recess was then taken to allow the committee to prepare its report, which was presented at 11:30, as follows:

ALABAMA

Mobile.—Simmons & Young.

COLORADO

Denver.—Charles J. Reilly.

CONNECTICUT

New Haven.—Curtiss & Pierpont Co.

DELAWARE

Wilmington.—Benj. F. Shaw Co.

DISTRICT OF COLUMBIA

Washington.—Biggs Heating Co.; Duparquet, Huot & Moneuse Co.; E. J. Febrey & Co.; Walter Higgins; Hubbard Heating Co.; Johnson & Morris; W. H. McCuen & Co.; Zellers & Co.

ILLINOIS

Chicago.—Davis Construction Co.

INDIANA

Bloomington.—W. A. Brissenden.

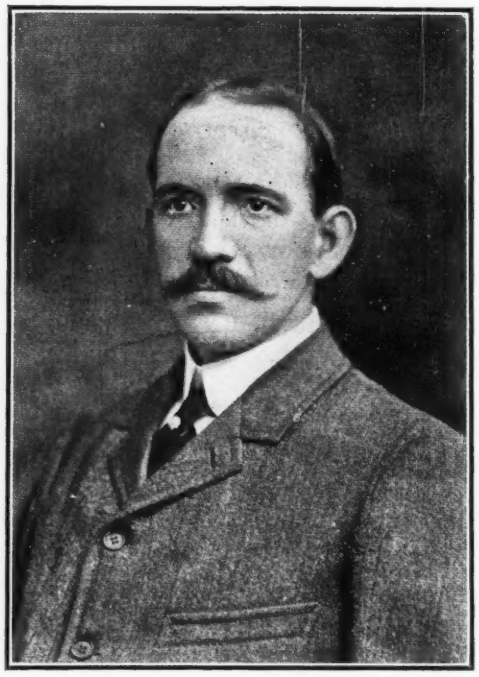
Evansville.—The L. Metzner Co.; H. G. Newman Plg. Co.; John O'Donnell; August Schmitt & Sons.

Fort Wayne.—H. F. Franke; Alfred Hattersley & Sons; Jahn & Meyer; M. J. Lordier; Emmett Martin; McPhail Bros.; Martin F. Noll; Albert Rolf & Brother; Robert Spice; Albert Tomkinson; F. J. Zimmerly & Co.

Indianapolis.—Charles Aneshaensel & Co.; Thomas J. Barker & Bro.; George W. Beaver; W. H. Caswell & Co.; Central Plumbing Co.; Clarke & Sons; Thomas Connell; Cook Bros. & Co.; L. E. Dailey; James A. Diggle; John C. Dunn; J. S. Farrell & Co.; Foley Bros. & Co.; Freaney Bros.; Gates & Fox; Herman A. Goth; Hayes Bros.; Healey & O'Brien; Hermann & Rothrock; Charles Holtman; John D. Irwin; W. H. Johnson & Son Co.; F. W. Keller; George W. Keyser; Kirkhoff Bros. & Co.; Kruse & Dewenter; George J. Nast Heating Co.; Henry M. Mock; Henry J. Schmidt;

L. P. Simon; Frank L. West; Wilcox & Judd; Charles R. Winter; Woollen & Callon.

Lafayette.—Lane-Pyke Co.; Cornelius O'Neill; Overesch & Werkhoff; A. R. Schmitz; Vaughan & Gallagher; Wallace Bros. Co.; H. M. Wheeler & Co.



HENRY L. HALL, PRESIDENT

Linton.—George F. Chapman.

Logansport.—Linton & Graf.

Muncie.—H. H. Highlands; Kirby & Hutzel.

New Castle.—W. D. Jennings.

South Bend.—Westbury & Smith.

Terre Haute.—Freitag, Weinhardt & Co.; D. W. Watson's Sons Co.

Vincennes.—J. H. Snowden.

Warren.—James H. O'Neil.

KANSAS

Ottawa.—A. P. Edder.

Salina.—Salina Plumbing Co.

KENTUCKY

Louisville.—Joseph McWilliams & Co.

MARYLAND

Baltimore.—Thos. C. Basshor Co.; Crook-Horner Co.; New York Steam Fitting Co.

MASSACHUSETTS

Attleboro.—J. W. Gifford Co.

Boston.—Buerkel & Co.; Cleghorn Co.; Isaac Coffin & Co.; Albert B. Franklin; Wm. H. Gallison Co.; Ingalls & Kendricken; Lynch & Woodward; J. P. Perry & Co.; A. A. Sanborn; Smith & Anthony Co.; Walker & Pratt Mfg. Co.; Walworth Construction & Supply Co.; Walworth Mfg. Co.

Brookline.—Kenrick Bros.

Taunton.—W. R. Park & Son.

Worcester.—John Burleigh & Co.; Washburn & Garfield Mfg. Co.

MICHIGAN

Menominee.—F. Robinson & Co.

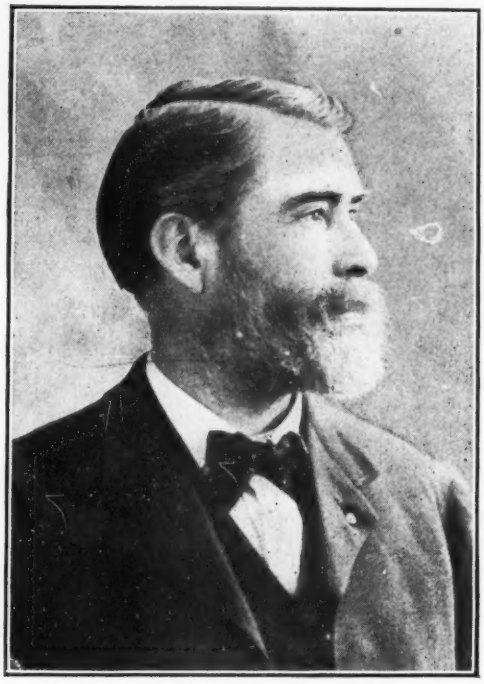
MINNESOTA

Duluth.—American Heating Co.

Minneapolis.—Pond & Hasey Co.

MISSOURI

Jefferson City.—Jefferson Heating Co.



P. GORMLY, VICE PRESIDENT

Kansas City.—Cotter-McDonnell Plg. & Htg. Co.; E. D. Hornbrook.

St. Louis.—J. T. Bradley & Co.

MONTANA

Anaconda.—J. A. Hasley; Ulrich Plumbing Co.

Billings.—Aitchison & Beeman; W. J. Pulte.

Bozeman.—J. W. Christie.

Butte.—Walter Allen; Eschle Plg. & Htg. Co.; Edwin Wright.

Great Falls.—John A. Collins.

ALBERT N. CHAMBERS, TREASURER

Helena.—Charles King; John Sturrock.

NEW JERSEY

Asbury Park.—George Turner.

Atlantic City.—Albertson & Young Co.; Currie Co.; L. E. Freeman; V. B. Giffin & Son; John H. Moore; Michael Touhey; Frank Walsh.

Newark.—Berla Brothers; Ira Budd; John Cooney (Harrison); T. B. Cryer & Co.; Denny Bros.; Walter P. Dunn, Inc.; Earl & Cook; F. & W. V. Engelberger; Theodore Geiser & Son; John F. Hough; Jaehnig & Peoples; Walter Lawson; Fred P. Merkel; John L. Reid; Ralph B. Schmidt; Albert J. Simpson; E. R. Soleau Co.; Storms & Co.; Zimmerman Plg. & Htg. Co.

New Brunswick.—Hugh McKeag & Son.

Passaic.—Aldous Plg. & Htg. Co.

NEW YORK

Binghamton.—Gaylord & Eitapenc Co.; Runyon & Ogden.

Buffalo.—Barnd & Geiger; Daniel Burgmaster; Charles A. Criqui; John W. Danforth Co.; Davis & Wright; J. H. Knepper & Son; Edward Leminger; T. McEvoy & Son; J. H. Ruckel & Son; M. F. Tallmage; H. J. Wood.

Corning.—Heermanns & Lawrence.

Elmira.—LeValley, McLeod & Co.; John T. Sadler & Co.

Geneva.—Emig & Hatmaker.

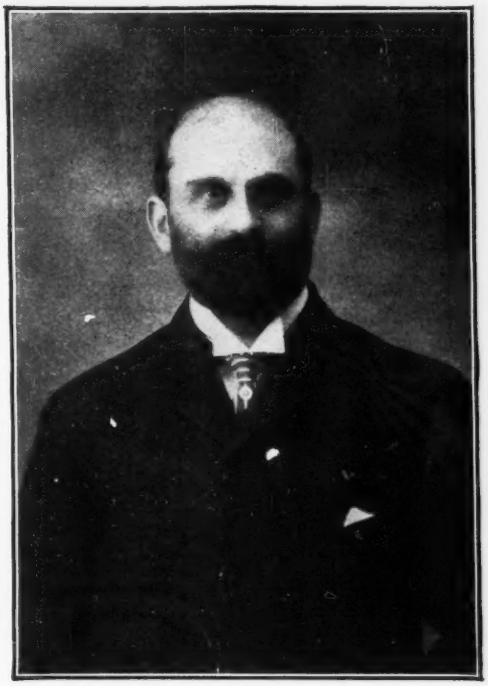
Hamilton.—Smith Hardware Co.

Hudson.—Byron Parker.

Jamestown.—Chatfield & Armitage.

Kingston.—Henry E. Wieber.

New York City.—Baker, Smith & Co.; Baldwin Engineering Co.; Blake & Williams; John D. Clarke's Son; John W. Cooney; James Curran Mfg. Co.; Frank Dobson; Evans, Almirall & Co.; Francis Bros. & Jellett; Gillis & Geoghegan; John Hankin & Brother; Johnson & Morris; Leonard G. Kirk; John Neal's Sons; New York Steam Fitting Co.; Phillips, Doup & Co. (Brooklyn); E. Rutzler; The Sayles Co.; John F.



HENRY B. GOMBERS, SECRETARY

Sayward & Co.; G. A. Suter & Co.; Walker & Chambers.

Niagara Falls.—F. W. Oliver Co.

Poughkeepsie.—P. C. Doherty.

Riverhead, L. I.—J. Irving Edwards.

Rochester.—Barr & Creelman; Chapman & Goodenough; F. H. Falls; R. T. Ford; Howe & Bassett; Milligan Bros.

Syracuse.—E. P. Bates, Edward Joy; William P. Murphy; William N. Tobin.

Troy.—William Ferguson.

Utica.—Stradling Plg. & Htg. Co.

NORTH DAKOTA

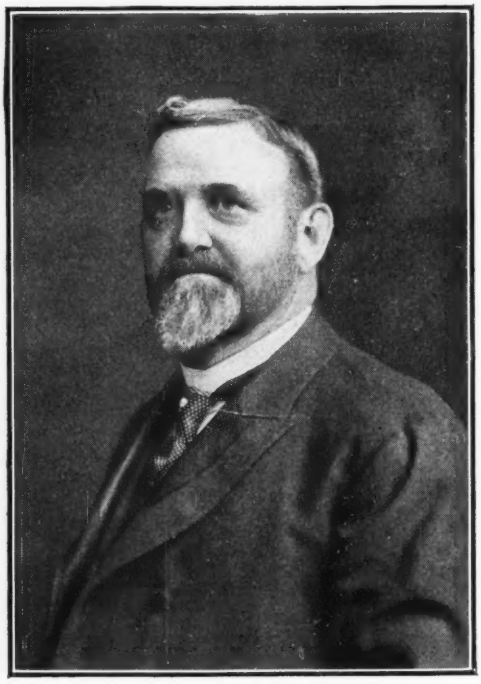
Mayville.—Rowe & Barr.

OHIO

Toledo.—Shaw-Kendall Engineering Co.

OREGON

Portland.—Brady & Sherrett;



ALFRED E. KENRICK, DIRECTOR

Wm. Eccles & Co.; Gardner & Kendall Heating Co.; Jacobsen-Bade Co.; Muirhead & Murhard; William Muirhead; J. F. Shea; William Stevenson & Co.

PENNSYLVANIA

Johnstown.—Johnstown Supply House.

Philadelphia.—Francis Bros. & Jellett; John Gormly; P. Gormly;

JOHN D. HIBBARD, DIRECTOR

Roberts Leinau; William Milligan; Harry F. Murphy & Co.; E. M. Nichols; Henry B. Pancoast & Co.; Robert Scott; John P. Smith & Co.; Thompson Brothers; John C. F. Trachsel.

Pittsburg.—Anderson-Darragh Co.; Baker, Smith & Co.; Iron City Heating Co.; P. F. Maginn & Co.; McGinness-Smith Co.; Pittsburg Heating Co.

Reading.—Keystone Heating Co.

Wilkesbarre.—B. G. Carpenter & Company.

York.—Blum & Eyster; C. Ed. Hantz; David Horn.

TENNESSEE

Chattanooga.—D. W. Clem.

WEST VIRGINIA

Charleston.—West Virginia Htg. & Plg. Co.

WISCONSIN

Chippewa Falls.—P. L. McQuillan.

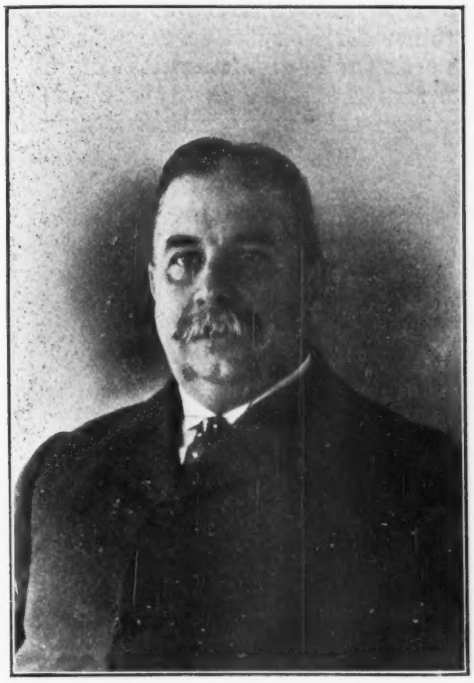
Watertown.—Otto Biefeld & Co.

The president then announced the following

COMMITTEES

CONSTITUTION AND BY-LAWS

Paul H. Kendricken, Boston;



HARVEY MIDDLETON, DIRECTOR

John Gormly, Philadelphia;
James M. Healy, Indianapolis.

APPEALS AND GRIEVANCES

John T. Sadler, Elmira;
John D. Hibbard, Chicago;
James S. McVey, Pittsburg.

GOOD OF THE ORDER AND WAYS AND MEANS

P. Gormly, Philadelphia;
E. D. Hornbrook, Kansas City;
Joseph A. Langdon, Pittsburg.

AUDITING

P. F. Maginn, Pittsburg;
W. J. Baldwin, Jr., New York;
W. H. Gaylord, Binghamton.

DISTRIBUTION OF REPORTS

John C. F. Trachsel, Philadelphia;
John L. Earl, Newark;
C. Ed. Hantz, York, Pa.;
E. D. Smith, New York.

NOMINATING

Stewart A. Jellett, Philadelphia;
W. H. Johnson, Indianapolis;
A. E. Kenrick, Brookline;
E. Rutzler, New York;
C. E. Hasey, Minneapolis.

The president then read the following:

PRESIDENT'S ADDRESS

We are to-day assembled to inaugurate the proceedings of the Sixteenth Convention of the National Association of Master Steam and Hot Water Fitters, and in conformity with the practice established by my predecessors, I am required to make a few remarks that are prefaced with the expression of a hope that their brevity will commend them. Remembering some past occasions like this, we agree with the pupil who was asked by his teacher, "What is the meaning of elocution?" and he replied, "It is the way people are put to death in some states."

This Association has shared the general prosperity that has pervaded

JOHN T. SADLER, DIRECTOR

the land, and each of your executive officers will report for his respective department the gratifying results that have accrued during the past fiscal year. It will be very gratify-

ing if the information that you will gather through careful attention to the reports of your officers will illuminate the transactions of this convention and shed much light on the subjects that demand our earnest thought and conservative action. Conservatism has been the safety-valve of this Association since its foundation, and in no degree must we relax our vigilance for the future on behalf of the fair name we seek to preserve. Yet I charge you to beware lest we sacrifice somewhat of our interests to conservatism. The demand of the times in business and

STEWART A. JELLETT, FORMER PRESIDENT

out, is for broad thought and action, and we as an association must be fully alive to the conditions as they exist.

Organization, the slogan of the employer and the laborer, means strength and protection, but not oppression, nor restraint, nor methods that offend. Our organization represents a principle that embraces reciprocal advantages if we proceed along proper lines. The value of a trade organization of masters has never been more ably demonstrated from the business man's point of view than in a recital of the history of the labor troubles of the building trades of the city of New York in the past twelve months. If an organization operated on well-defined lines, consistent with modern business practices, is of value to one line of trade it is valuable to another, and the wider knowledge we gain of the needs and opportunities of master fitters the more firmly are we convinced that organization is an absolute necessity to the men of the steam fitting business throughout the United States. This Association of to-day is but the nucleus of a greater organization that must one day exist for the good of the steam fitting fraternity, and we cannot help being greater, for we have never taken a backward step and we never will. Do you value this Association as you ought? Do you use its privileges as its founders intended you should? Have you figured what the Association means to you individually? Compute if you can, gentlemen, how much you are enjoying the purchase of other men's toils and the results of their patience and steadfastness.

We need an organization whose purchasing power, represented in its membership, shall be so large and so valuable that its good will and recognition will be an asset sought for and prized by every manufacturer and dealer in steam goods in this country. Let the suggestion of the necessity be a prophesy, if you will, and bend your every energy toward its fulfilment.

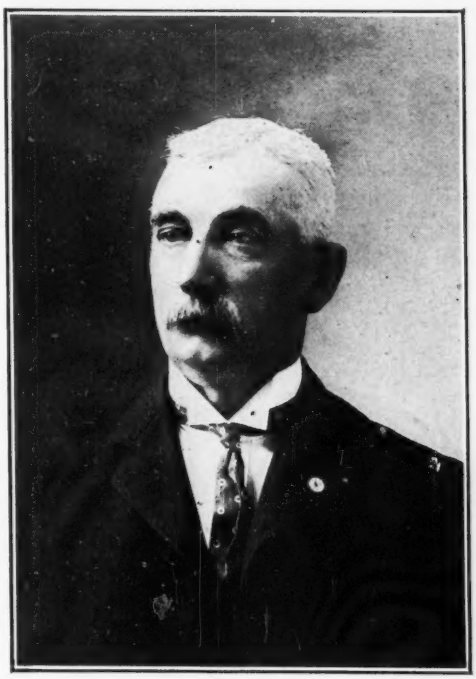
Admiral Dupont was explaining to Admiral Farragut why he had not sailed into Charleston harbor with his fleet of ironclads, when Farragut answered, "There is one other reason." "What is it?" "You did not believe you could do it." That illustrates the two types of men one finds —the man who says, "This ought to be done, but cannot be, because it never has been," and the man who says, "This ought to be done," and does it; and then the crowd who predicted failure are heard again to say, "We always knew it could be done."

We want to see this Association composed of men who can see what

ought to be done, and then dare to do it. We need members and we want only the best men in our line of business in their respective localities. We cannot afford to sacrifice character for numbers. We want Master Steam Fitters in our ranks who believe in the reciprocal advantages of organization. We want men who believe in the basic principles of fair trade protection. We want men who believe that a membership in the Association of Master Steam and Hot Water Fitters stands for a duty to their fellow members, to the firms whose names appear on our "List in Accord," and to the fundamental principles of this Association as expressed in our constitution and by-laws. It is the duty of every member to further the interests of this Association by endeavoring to secure new members and yet be not so overzealous as to lose sight of the fact that quality is the first essential.

We must adopt attractive methods for the establishment of local and state associations in desirable localities. We have got to employ some means of promulgating the reasons why it is desirable to become a member of our Association. If paid organizing agents are the best means of accomplishing this, then let us have them. There are throughout the United States quite a number of isolated master steam fitters' associations not now affiliated with our national body, and measures should be adopted to attach them. Until we have a national membership of greater numbers and with a wider geographical distribution than we possess at present it is scarcely possible to maintain hopes for the active co-operation and hearty sympathy of the powerful organizations of manufacturers and supply dealers.

The protective measures that this Association has for many years approved do not meet with the unconditional and loyal support from our own members, or from the firms whose names appear on the "List in Accord," that the most active supporters of this Association desire. We are frequently confronted with the spectacle of members of the Association of Master Steam and Hot Water Fitters being regularly advertised as the authorized agents of firms whose past and present acts preclude all possibility of their names being on our "List in Accord." And this condition of affairs usually exists in a locality where our membership is weak. If we will actively enter the field and commit ourselves to a scheme of missionary work, the purpose of which shall be to secure members all over the United States, it will be possible for us to establish



GEO. H. ZELLERS, SERGEANT-AT-ARMS

reciprocal relations with people who now are inclined to the belief that they can do very well without the recognition of this body.

Given a membership that possesses ample purchasing power, we shall be in a position to enforce fair demands for protective measures on reasonable terms, but the time has never been in the history of this Association, and your President has an abiding conviction that the time never will be, when we could enforce the oft-suggested policy of "sell-to-members-only." Gentlemen, a policy of this kind is un-American and it is un-

worthy of this Association, surrounded as it is by traditions of business judgment tempered with fair-mindedness. Some of the most loyal members of this Association may charge me with heresy, but I speak my honest convictions, and I do not believe that the "sell-to-members-only" policy can succeed.

In answer to a call for a meeting at Indianapolis of the Trade Relations Committee, your President made a trip last January, covering a period of about sixteen days, during which time he attended a convention held at Topeka by the Kansas State Association of Master Plumbers. It was hoped that the visit would be productive of the establishment of a State Association of Master Steam Fitters for Kansas. It seems quite probable that a Kansas State Association of Master Steam Fitters will be organized, if this Convention in its best judgment modifies somewhat the amount specified for dues and initiation.

On the homeward trip Kansas City, Indianapolis, Chicago, Youngstown, Warren, Pittsburg and Philadelphia were visited. Many were the invitations that were given to Master Steam Fitters to join our ranks, but to many prospective members the question of dues was a stumbling block. Informal conferences were held with prominent members of our Association, as well as with officers of influential supply associations, and the concensus of opinion is that we need active membership outside of the states of New York, Pennsylvania, Indiana and Massachusetts.

We must be persistent in the maintenance and increase of our Association, and guard well against the evils of apathy. Action will remove the doubt which theory cannot solve.

The trip west left one vivid impression in your President's mind; that is, that wherever a good, vigorous local association was organized there existed profitable business and harmonious relations between competitors in the steam fitting trade and between the trade and the rivals for their orders in the supply trade. Where the local associations had grown apathetic or disorganized there was strife, and above the din of battle rose the hateful war cry of "Slash and cut!" Do you want any better argument to demonstrate the reciprocal advantages of organization?

Some members there are, and we have firms on the List in Accord, who possess degrees of loyalty that might be classified in the manner adopted by a groceryman who displayed signs for "new laid eggs," "fresh eggs" and "plain eggs." "Are the plain eggs all right?" inquired a customer. "Oh, yes. We call 'em 'Saturday night eggs.' That's because they have been trying all the week to be good." Pay attention to your List in Accord, and your List in Accord will pay attention to you.

We have tried to impress it upon manufacturers and supply houses that they would always find prompt response to their complaints of violations on the part of their competitors, and we have thus met the contention that "the other fellow does it." During my trip West several prominent manufacturers felt it their duty to point out the infractions and disregard of the spirit of our Trade Resolutions on the part of their neighbors who were rivals, and were vociferous in their claims for our attention because they observed so fully the letter and spirit of our most rigid exactions. Into our official ears are poured tales of how consumers are being supplied with goods and how we permit the offenders to bask in the sunshine of the inestimable privilege of the List in Accord, while a daily loss of valued business follows in the wake of the firms that are steadfast in their loyalty to the interests of the Master Fitters' Association. Their relative position, however, seems similar to that portrayed in the incident of the lady whose small son entered the parlor bearing the marks of struggle while she was receiving an afternoon call from her clergyman. "Willie has been a very bad boy," said his mother; "he has been fighting again

and has a black eye." "So I see," said the reverend caller; "Little boy, come into the next room and I will pray with you." "Huh!" said Willie, "You better go home and pray with your own little boy. He's got two black eyes."

These remarks are of a perfunctory character, but if they leave with you an impression that your President believes in this Association and its purposes, and has helped strengthen your belief, then it is not in vain.

The Secretary read the following cablegram from that absent friend of everybody, A. B. Jenkins, who was at the time traveling in Europe: "May the Master Steam Fitters meet with continued success. I send my regards to them and their ladies."

The Secretary read the following communication from W. F. Costello, Secretary of the National Association of Steam and Hot Water Fitters and Helpers of America:

"On behalf of this association, in convention assembled, I am pleased to extend to the members of your association our fraternal greetings and express the hope that your deliberations may be productive of good results to the craft that our respective organizations are interested in. It affords me pleasure to state that our relations with the members of your association are friendly, and we desire to express the hope that nothing will occur in the future to sever those relations. We feel that our interests are inseparable, and trust time will cement more closely the mutual and agreeable feeling that should be established between employer and employee. Let us trap our resentments, superheat our friendliness and couple our relations."

The Convention then went into executive session.

TUESDAY AFTERNOON SESSION

The entire afternoon was spent in executive session, in the course of which the following reports were received and disposed of:

SECRETARY'S REPORT

The organization, of which you are members, now assembled in Convention, has cause to be proud of the position it maintains with those with whom it comes into contact, and who understand and appreciate the work that is being carried on by you.

At times there appears to be a falling off in the enthusiasm of individual members or Local Associations; and while a continued coolness is to be deplored, it does not necessarily follow that a lack of exceedingly high pressure is to be regretted, especially when maintained for the purpose of carrying out radical measures.

Conservatism with firmness has been the backbone and force which enabled this Association to obtain and maintain the position it now occupies.

It has been very hard to convince some of the members that their best interests and those of the organization lie in the direction of standing loyally by one another by means of standing by your friends on the List in Accord to the exclusion of the concerns who refrain from obtaining, or, if obtained, of retaining a place on that List. It is only fair that you follow your own precepts as declared by the Association in its motto, "Who Helps Me I Help." If it were possible to give you in detail the work carried on at Headquarters it would doubtless surprise, and at the same time please, those who have not had the personal experience to be obtained while acting in the capacity of a member of the Board of Directors. It certainly would convince them that members of this Association should purchase their goods from those on the List in Accord even when there is at times a slight increase in the cost as compared with goods offered by those not on the List.

A slight increase in price could consistently be paid to friends as a sort of compensation for their loyalty to the principles for which this Association stands.

Correspondence

Few members realize the amount of correspondence necessary to carry on the business of the Association.

While statistics are generally very dry and do not appeal to the average person, it seems as though it had become a part of the Secretary's duty to present in his report some figures showing the number of communications received at and sent from Headquarters. If no other purpose is served, it will give the members an opportunity to judge of the work done in comparison with their own business correspondence.

During the fiscal year 2,186 letters have been received. We received many circulars, catalogues and papers, of which we keep no count.

Letters on general business, special letters, circular letters and notices, going as first-class mail from National Headquarters amounts to 10,662 pieces.

Copies of Standard Flange Schedules, Uniform Contract blanks, "Official Bulletins" and all second, third and fourth class mail are not included in the foregoing items.

"Official Bulletin"

Once more we can report that no complaints have reached us as to the policy followed in the conduct of the official organ of the Association.

For many years it has been a hard and fast unwritten rule to decline all advertisements offered by any concern whose name was not upon the List in Accord.

We repeat the request, which we have made many times heretofore, to-wit: that members furnish material for publication in the "Official Bulletin." News items, clipped from papers or magazines, are serviceable if they relate to the trade. It is not absolutely necessary to furnish us with an essay of your own, although we would very much like to have same; send us the ground work and we will endeavor to put it in shape for publication. You individually are interested in the other man's ideas or views; is it not reasonable to think the other man is interested in your views?

Complaints

It would be impracticable, as well as tiresome to the Convention, to present and report upon all of the complaints received at Headquarters during the past year.

For the purpose of giving you a general idea of the variety, we have selected a few which can be briefly touched upon, and, if it is your wish to have any particular one more fully described, we can readily comply with the request.

It must be apparent to members of this Association that it takes time and considerable patience to properly investigate complaints, and more especially is this the case when the complaint is against one who tries to evade the issue.

It is most exasperating to have a representative of a concern on List in Accord, against whom complaint is made, meet you with the proposition that if he did not do the act complained of some other fellow would, and he knows a lot of them that do it. When pressed to make good his assertion, the chances are that his reply will be in effect that he is not going to get mixed up with his competitors. Generalties do not form the basis of an investigation by your Board of Directors.

The List in Accord

last year had 41 additions thereto, and 20 were dropped, making a net gain of 21.

Membership

Fifty-three new members have been added to the roll during the past year.

In passing it may be said that the membership of the local associations in the principal cities changes but very little. It is in the smaller cities, and states where no state association is maintained, that the changes are more pronounced.

The past year has been a very troublesome one for some of the local associations who have had the labor question to wrestle with. It ought to be evident to those who are out of the Association, as well as to those within the ranks, that had

there been no association it would have been immeasurably worse for the interests of all concerned, and therefore it behooves some of the outside Master Steam and Hot Water Fitters to take up at once the question of joining their trade association, both local and national.

This Annual Report, which is the eighth that your Secretary has had the privilege to present, can properly be closed by briefly referring to the general condition of the Association.

Financially, its condition has increased in strength over last year, which, in turn, was stronger than the year before. Numerically the membership is somewhat larger than the year previous, and we think it has not deteriorated, but rather improved in the loyalty shown by the general membership.

There are some steam heating concerns whose names are absent from the roll, but they are the losers. When they realize that they owe a duty to the trade, as well as to themselves, they will doubtless see the necessity of joining and sustaining this Association.

Thanks are hereby tendered to the officers of the National, State and Local Associations and to the many members who sustain the officers in the performance of their duties.

May the Association continue its work in a manner which will finally commend the respect of those who have waited and watched in vain for some act that could be construed as unfair and for which the Association could be called to account.

This Association, now holding its sixteenth annual convention, has been conservatively managed in a manner that must commend itself to all those who believe in standing firm when you know you are right.

May this convention be one that will stand forth as having legislated wisely for the best interests of its members, and of manufacturers and dealers, and all those whose welfare is desired by the National Association of Master Steam and Hot Water Fitters.

REPORT OF THE BOARD OF DIRECTORS

At the close of another year—the sixteenth of our existence as a supervising industrial association—it is pleasing to look back over the way we have come and note the progress we have made and the matters wherein we have failed.

The past year has been one of progress—of strengthening and fortifying positions gained in previous years, as well as of advance along new lines.

For convenience of operation, the Board of Directors appointed from our number Messrs. Hall, Smith and Chambers, as a sub-committee to attend to detail work not requiring the attention of the full Board. This arrangement has worked well and has expedited matters very much. Topics of importance have been reserved for the judgment of the whole Board, at its meetings, which have been held at frequent intervals, the total number having been ten.

The Board calls attention to the aggressive work done in organizing new associations in different localities, which has resulted in the addition of members to our ranks, and a much wider diffusion of the principles and objects of our Association among members of our craft who have not heretofore been identified with us.

In seeking these new members, however, your Directors were impressed with the fact that the initiation fee, for members doing but a limited amount of business, was a strong impediment in the way of their enrollment. Very decided objections have been made to this sum, which is looked upon as excessive, especially when compared with the more moderate amounts charged by other trade associations. Your Directors, in view of these objections, and the consequent curtailment of new accessions to our ranks, recommend that the initiation fee be reduced. We believe that the wisdom of this change will be seen in the increased enrollment of new members.

The operation of our rules con-

cerning the List in Accord has been a matter of great concern during the year just closed and questions have arisen which have made it seem wise to submit the legal aspect of the subject to counsel.

We accordingly consulted a firm of lawyers well versed in trade affairs, and have been advised by them that our present position, as regards the List in Accord, is entirely tenable and defensible, and that we are completely within our rights and privileges in maintaining the list and enforcing observances upon its signers. As they express it, "The Trade Resolutions seem to have been drawn with great care, and in our opinion, based on a careful consideration of the authorities, they are unobjectionable from the legal standpoint."

This has proved advantageous to us, and the merit of the idea of trade protection has been shown in the particular instance of a concern which has complained of the strictness with which the Trade Resolutions have been interpreted by some of the signers thereof; this strictness interfering, as was claimed, very much with the prosecution of this particular branch of the firm's business.

We regard this as a fact of deep significance—first, because it shows that we exert a power that makes itself felt, and secondly, because this power will attract to our ranks many who have heretofore been lukewarm and indifferent.

A further indication of this power is found in the fact that the number of complaints of infraction of Trade Resolutions by parties on the "List in Accord" has fallen from 47 during the previous year to 25 during the year just closed.

The Defense Fund has been maintained in its specific phase.

The Board has not found it necessary to divert any portion of this money to purposes other than originally contemplated, although authority to do this was given by the last Convention.

The general funds have been ample for all necessary expenditures without encroaching on this special treasure. Under ordinary circumstances, we believe that this state of affairs can be continued.

Elias D. Smith, Chairman; Albert N. Chambers, P. Gormly, Henry L. Hall, John D. Hibbard, Alfred E. Kenrick, Harvey Middleton, John T. Sadler.

TREASURER'S REPORT

Cash on hand May 1, 1903	$4,316.54
Receipts, May 1, 1903, to May 1, 1904	8,922.48
Making a total of	$13,239.02
Expended May 1, 1903, to May 1, 1904	8,305.49
Balance on hand May 1, 1904	$4,933.53

A. N. CHAMBERS,
Treasurer.

WEDNESDAY AFTERNOON SESSION

After several hours of executive session the Convention went into open session for the election of officers.

The nominating committee presented its report, which was unanimously accepted, and the Secretary was directed to cast a single ballot for each of the nominees, all of whom were thereupon declared duly elected to their respective offices for the ensuing year, as follows:

PRESIDENT—Henry L. Hall, New York.

VICE-PRESIDENT—P. Gormly, Philadelphia.

TREASURER—Albert N. Chambers, New York.

SEARGEANT-AT-ARMS—George H. Zellers, Washington.

BOARD OF DIRECTORS—The above officers and A. E. Kenrick, Brookline, Mass; John D. Hibbard, Chicago; Harvey Middleton, Baltimore; John T. Sadler, Elmira; James S. Healy, Indianapolis.

The Board of Directors at once organized and re-elected H. B. Gombers Secretary. Arthur S. Armagnac will continue to act as Assistant to the Secretary.

WEDNESDAY AFTERNOON SESSION

The chief business of the session was the installation of the newly-elected officers. Former President E. D. Smith was called to the chair and he appointed Messrs. P. H. Kendricken and S. H. Jellett a committee to escort the officers to the platform. President Hall, on taking the chair, made a clever little address, in which he impressed upon the members that the keynote of their success last year had been loyalty, and that loyalty must be the keynote for the coming year; that if they would all be loyal and stick together they could but win.

The committee then presented Vice-President P. Gormley, in greeting whom the President said, "Your distinguished courtesy never forsook you; otherwise I would not be here as your side partner for another year." As the other officers were brought to the platform they received similar greetings, Treasurer Chambers being congratulated on having the funds still in his possession; Sergeant-at-Arms Zellers on his zeal and special aptitude for his work; Director Kenrick on his long years of faithful and effective service; Director Sadler on his distinguished service in the National Guard; Director Healy on his selection as the representative of the new and vigorous organization in Indiana.

Mr. Jellett offered a resolution congratulating Former President Elias D. Smith on his retirement from active business, but regretting his consequent withdrawal from active work in the Association, and thanking him for what he had done for the organization. The resolution being carried unanimously, Mr. Smith expressed his gratification and his pride in being the subject of such a resolution. He thanked the members for the way they had co-operated with him during his years of service. He said he was going to be what the Lord cut him out for—a genteel loafer—but he wanted some help, even at that, and there were others in the room who ought to do as he was doing. He said he would miss meeting his friends and would try to come and see them sometimes.

On motion of Mr. Rutzler, Mr. Smith was unanimously elected an honorary member of the Association.

Mr. Rutzler then, in conformity with long-standing tradition, offered the customary resolutions of thanks to the ladies, the press, the hotel management, etc.

The Convention then adjourned.

BOARD WALK JOTTINGS

Harry S. Martin, general sales manager, and Walter S. Appleton, New York manager, looked after the interests of the U. S. Radiator Co., Dunkirk, N. Y., in a manner calculaed to favorably impress all beholders and incidentally to similarly impress prospective purchasers of Triton radiators.

Herbert A. Joslin told people what he knew and what they ought to know about the merits of the Powers Regulator. Mrs. Joslin was also in it from start to finish and enjoyed all of it.

Several lines of mourning were hung out when Col. Coppins took his departure. (In mentioning Coppins we need not allude to Walworth Mfg. Co., Boston, as the names are inseparable in everybody's mind.) During the few hours that the Colonel was able to be there he made a mark that lasted all through the week and then hurried home to perform his part as chairman of the entertainment committee to the visiting Filipinos.

The unprecedented absence of A. B. Jenkins was much deplored. It transpired however that for the time being the mantle of Elijah had done rather a good job in falling upon the shoulders of Elisha, Elisha in this case being represented by Chas. F. Webber, who was "on the job" all the while.

Not being able to get a parlor, he fixed up a basement storeroom with enough flags and things to make it look like home and set up a little altar to the gods surmounted with a large bowl of pink lemonade, the pinkness whereof was due to something other than lemons.

It is needless to say that there were many worshippers at the shrine. In the performance of his arduous duties Mr. Webber was ably assisted by Mr. J. B. LeCompte, of the Philadelphia office of Jenkins Bros., who is an accomplished squire of dames, also by the genial Harry G. Logan. Between these three geniuses everybody was made happy.

American Radiator Co. sent to the scene of action a group of gifted spellbinders. Secretary Charles K. Foster, and Boiler Manager Geo. E. Downe were aided and abetted by L. F. Moore, of New York, and C. K. Glore, of Philadelphia. Careful observation failed to detect them in losing a trick.

Homer Addams, Allentown, Pa., has a large number of strings to his bow. His business card shows that he represents the Kewanee Boiler Co., Model Heating Co., Kellogg-Mackay-Cameron Co., and the Uniontown Acme Radiator Co. Mr. Addams is fully competent to successfully take care of all these varied interests.

W. T. Isaac, manager of the Gurney Heater Co., Boston, was busy all the while. He was accompanied by his New York manager, Geo. Rinkenberger.

S. H. Beard came up from Reading and told about the merits of Sunshine Boilers made by his company, Reading Stove Works, Orr Painter & Co., Reading, Pa.

Stewart A. Jellett, Philadelphia, always an active Association worker, brought with him another bunch of activity in the shape of Stewart A. Jellett, Jr., who was in everything going.

Col. Richard Hewins, 18 S. Seventh street, Philadelphia, represented as usual the American Steam Gauge and Valve Mfg. Co., of Boston.

H. W. Johns-Manville Co. carried off the palm for showing up with the largest representation. Their band of missionaries consisted of T. T. Lyman, assisted by C. H. Tower, F. R. Austin, W. A. S. Clarke, C. R. Sparkes and D. T. Dickson.

It was impossible to lose them. They seemed to be at the convention meetings all the while, and yet they were on the boardwalk, in the ten pin alleys, in the grotto and everywhere else. Their work was exceedingly fine.

J. L. Mott Iron Works were represented by the veteran J. J. Blackmore, who was at his best. He was looking after the business interests of his company all the while, even while he was getting a lot of fun out of it for himself.

A. A. Griffing Iron Co. had a good delegation consisting of W. M. Cosgrove and Leonard Elliot of Jersey City, and A. W. Mappett of Philadelphia.

John D. Hibbard, Chicago, was not only delegate to the convention, but found time to look after the interests of the big manufacturing concern of which he is manager, the John Davis Co., Chicago.

National Radiator Co., Johnstown, Pa., had two representatives on the ground—C. A. Frank and O. Pierce, who knew the whole story about radiators.

W. M. Mackay was present in several different capacities. He was manager of the New York Radiator Co., manager of the New York branch of the Hart & Crouse Co., secretary of the American Society of Heating and Ventilating Engineers, and engineer on his own account. He tried to look after all these varied interests and accomplished three or four things on the side.

He was accompanied by Mrs. Mackay or there is no telling what might have happened.

Fred J. Vaux, of Buffalo, was on deck most of the time. He never let loose his famous voice until he found himself on the hurricane deck at Secretary Gomber's Somers' Point shore dinner. Then he repeatedly produced his obituary of Jones, interspersed with calls for refreshments not on the menu. His faintest wispers were audible all over that part of New Jersey, and somebody has named him "Mr. Voice, of Buffalo."

A pleasing convention souvenir was the celluloid-encased tape measure of the Pierce, Butler & Pierce Mfg. Co., Syracuse. Each lady got one to take the measure of her summer shirt waist and some of the men were seen carrying them around with the ostensible purpose of measuring up a house.

Messrs. Valleau & Costigan, of the Valleau-Costigan Mfg. Co., Brooklyn, N. Y., told tales of magnesia and asbestos covering, and incidentally enjoyed the pleasures of the meeting.

The O'Meara exhibit of valves and other specialties was most interesting and the ingenious devices shown attracted everybody.

Fred J. Howe represented the Borden Co., of Warren, O., and his demonstration of the work of their pipe threading machines made everybody sit up. One man was even known to sit up all night and several men tried to carry away pieces of the machines as souvenirs.

An exhibit which kept many people looking for a long time was that of the Kinnear-Hood Steel Co., who displayed their new radiators in the billard room. Messrs. Kinnear and Nowell could tell all about their construction, and the beauty of the goods was much admired.

Secretary Gombers, on Wednesday evening, gave a small boardwalk blowout to the officers, at which were present Mr. and Mrs. Henry L. Hall, Mr. P. Gormly, Mr. A. E. Kenrick, Mr. and Mrs. S. A. Jellett, Mr. J. M. Healy, Mr. and Mrs. John T. Sadler, Mr. and Mrs. H. B. Gombers, Miss Blackwood, Miss Birge, Mr LeCompte and Mr. Armagnac.

The first feature was a darky cake walk on the steel pier, then the Johnstown Flood, next a small line of Japanese pingpong, concluding with a Welsh rabbit at the Islesworth.

Warren Webster & Co., Camden, N. J. are always on hand at such affairs. This time there were present Messrs. Warren Webster, Theodore Webster, and their Philadelphia manager, W. W. Morgan, also their Chicago manager, James H. Davis.

Abendroth Bros., New York, sent their boiler manager, J. B. Bernhard, a most efficient convention hustler.

C. M. Stokes, of Philadelphia, ran down to the shore to represent the Norristown Covering Co., Norristown, Pa.

Geo. D. Hoffman, secretary and manager of the Norwall Mfg. Co., Chicago, was unable this time to find accommodations for a working display of the Norwall Valves, but did a lot of talking about them, and had always with him a most ingenious and practical pipe wrench.

H. A. Joslin celebrated the tenth anniversary of his wedding by taking Mrs. Joslin for a little trip, which included the three days at Atlantic City. They were both busy, Mr. Joslin representing the Powers Regulator Co., Chicago, and Mrs. Joslin doing the attractions.

H. T. Gates, secretary of the Kellogg-Richmond Co., New York and Norwich, told people all about the surpassing merits of the Richmond line of steam and hot water boilers.

The interests of Smith & Thayer Co., Boston, were excellently looked after by Howell Johnson, of New York, who was full of ideas about Winchester boilers.

George E. Walton represented the Eaton, Cole & Burnham Co., of New York.

Smith & Anthony Co., Boston, had their heating and ventilating manager, E. O. Burrows, on hand at the convention for a few days.

M. B. Moore, Pennington, N. J., was busy all the while in the interest of the M. B. M. boilers made by the Pennington Foundry and Heater Co.

Model heaters were talked up by F. C. Eckfeldt of the Model Heating Co., Philadelphia.

F. W. Herendeen, of the Herendeen Mfg. Co., Geneva, N. Y., came to the convention accompanied by the tallest member of his staff, J. Naylor of Washington.

George I. Roberts, of George I. Roberts & Bros., New York, was able to give a couple of days to the convention.

E. H. Roberts, of the Standard Steam Specialty Co., New York, saw the "Utility" of remaining throughout the meeting.

H. D. Bristol, of New York, was an interested and interesting visitor. Uppermost in his mind was the Johnson System of Temperature Regulation. With him was Kennedy Duff of the Philadelphia office of the Johnson Co.

No convention was ever known to come to a satisfactory conclusion without the presence of Timothy Kieley. This time he was a few minutes late and the movement flagged somewhat, but it picked up on his appearance. Before he got there, he had arranged one of the few displays, consisting of a nickel plated model of his Standard Waste Heat Utilizer, an aluminum model of his "Special 98" vacuum recording valve, and one each of his model expansion steam traps, of his Standard Trap, and the Mueller steam trap. Appropriate descriptive matter was at hand. J. J. Brogan, of the Philadelphia office, assisted Mr. Kieley in expounding special points of merit.

H. B. Smith Co., Westfield, Mass., had a strong representation, headed by J. C. Faulkner, assistant manager of the New York office. With him were C. A. Miller of New York, and H. C. Walther and H. S. Minnick of Philadelphia.

Secretary P. M. Beecher and New York Manager E. C. Molby efficiently stood for the merits of the Pierce boilers made by the Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.

Philip Carey Mfg. Co., Lockland, O., were represented by the presence of J. B. Colladay, their Philadelphia representative.

W. P. Babcock, Cleveland, O., was on hand to represent his company, the Bishop & Babcock Co.

Arthur P. Cox, 85 Liberty street, New York, represented the Ashcroft Mfg. Co., the Consolidated Safety Valve Co., the Hayden and Derby Mfg. Co., and Hancock Inspirator Co.

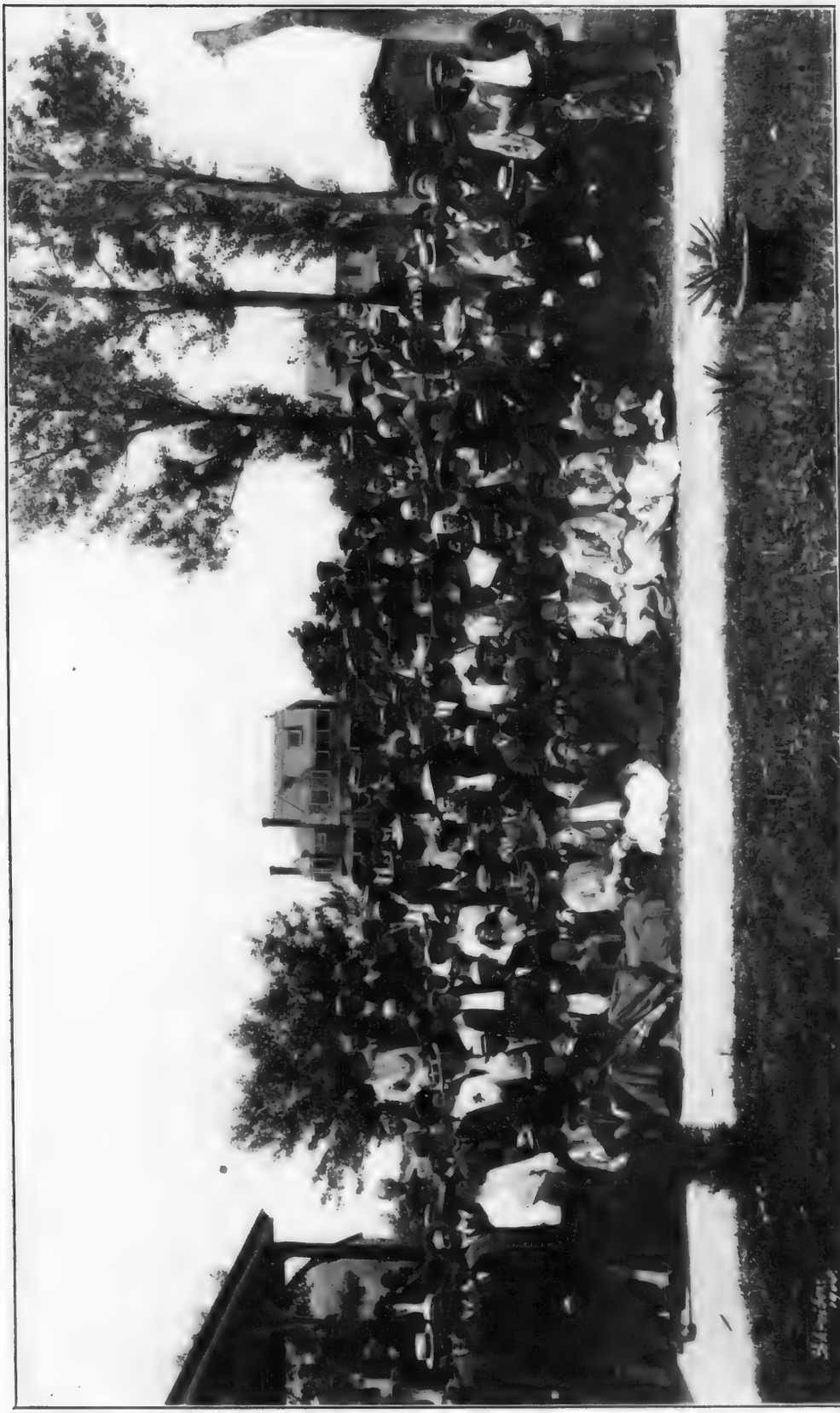
One man new to the trade created a little amusement and distinguished himself by asking the name of the company for whom Charley Geoghegan travels.

Frank J. Corbett, of the Ashton Valve Co., was as usual the sweetest singer of the convention. Whenever music was called for, he was generous in supplying the demand and won all kinds of applause.

Another group of minstrels was developed on the return from Somers' Point when Messrs. Foster, Isaac, Miller and Glore demonstrated the possibilities of an impromptu quartet.

A lone swimmer was J. J. Blackmore. He organized a promising looking bathing party for Thursday morning, but as he had the only bathing suit in the outfit and the bath houses were closed, he had a swim all by himself.

The star veteran of the Steamfitters' Association, so far as attending conventions is concerned, is now Albert E. Kenrick of Boston. He has been present at every meeting and the universal wish is "long may he continue to maintain his unbroken record."



A GROUP ON THE LAWN AT SOMERS' POINT

"A cast iron dream" sounds something like a nightmare,. but a Parisian dream of Mr. Fred Hodges has been converted into light and airy cast iron by the necromancers of the American Radiator Co. and the result is a very beautiful souvenir ash tray. The only fault that can be found with it is that it is not practical. Nobody would desecrate those graceful outlines and those flowing skirts with the ashes of the Havana and most of these ash trays will be converted into mural decorations.

Model Heating Co., Philadelphia, Pa., reminded every man that it was his turn to smoke up by presenting a rubber matchbox bearing the trade-mark of the company—a reminder of the old days of "Gee Whiz, see 'er serkerlate."

A fine body of soldiery lined up on the boardwalk Thursday night under the command of Gen. E. D. Smith and Col. J. T. Sadler. There were Amazons in the platoon as well as masculine heroes, and after various feats had been performed to the satisfaction of the performers the ladies were safely placed on a high table to look at Mr. Paine's fireworks, while the heroes aforesaid went around the corner to inspect the quenching possibilities of a well known café. Even there their military instincts did not forsake them, as they were seen at the word of command to surround and capture a round table.

The first violin in the Rudolf Grotto was something of a cynosure, and there were many toasts to her technique. Some enthusiastic spirits even joined in the song, "All Aboard for Dreamland."

Fish Commissioner-in-Chief J. C. Faulkner secured a bunch of bait and some enthusiastic comrades on Wednesday and went out to see what there was in the briny deep. The only catch was a very diminutive whale triumphantly brought home by Thos. F. Egan, of Washington.

A. L. DeVoe, of Thatcher Furnace Co., New York, mingled with his many customers and made new friends for Thatcher boilers.

T. F. Cushing, secretary of the E. F. Keating Co., New York, does not like to miss a convention and did not miss any of the points of this one.

The college girl has invaded the ranks of the steamfitters. Miss Hantz, of York, Pa., who was at the Atlantic City convention, left there for Bryn Mawr, Pa., to take her college examinations.

H. L. Anness told everybody he could get hold of about the superlative merits of the new Richardson line of steam and hot water boilers.

He was accompanied by W. E. Jacobus of the company's Philadelphia office.

Secretary Gombers, not content with his nice little board walk entertainment, took the whole crowd out Thursday. More than one hundred and fifty delegates and guests boarded a string of trolley cars that took them far down the coast to Long Port. There two small steamers and a sail boat conveyed them across the bay to Somers' Point. The trip was not devoid of incident.

The people in the sail boat were trying to overtake the last of the steamers and as two or three times they seemed quite likely to do so some little excitement was created.

One of the carryalls taking on a party to the trolley ride was shipwrecked. It happened this way: Fred Vaux was on board, and seeing a horse coming down the street he spoke to it in his gentlest tones. As was natural under such provocation the horse ran away, smashing into the carry-all, throwing everybody into a cold perspiration and disappearing in the direction of the steel pier.

Arrived at the Point, Mr. Gombers had provided a fish dinner, the following being the menu:

Little Neck Clams.
Olives. Radishes. New Onions.
Clam Chowder, Somers' Point Style.
Fried Oysters, Maryland Style.
Great Egg Harbor Bay Weakfish, Baked.
Potato Croquettes.
Sliced Jersey Tomatoes. Succotash.
Atlantic City Green Peas.
Neopolitan Ice Cream.
Crackers. Assorted Cakes. Cheese.
Coffee.

While Mr. Gombers' wishes in regard to some details were not fully carried out, everybodv was more than satisfied.

A beautiful souvenir of the meeting was distributed, the front page of which was devoted to Admiral Webber's sailing party. the grandfather of Thomas Eagan's fish, and an ancestor of Mr. Vaux working a primeval megaphone.

The Trade Press was as usual strongly in evidence. Frank K. Chew was present everywhere throughout the sessions and the recreative features. A. A. Ainsworth stayed long enough to make his presence count and reluctantly obeyed the call for business elsewhere.

H. T. Sherriff, editor of Domestic Engineering, Chicago, and E. DeF. Winslow of the Philadelphia office of that paper, mingled with their friends and took notes on everything they saw.

J. M. Heatherton, of the Plumbers' Trade Journal, made his first appearance in some years at the Steamfitters' convention. He was accompanied by his associate, H. N. Carruthers.

L. D. Collins and H. D. Carter represented the Engineering Review.

The Heating and Ventilating Magazine was represented by H. A. Smith.

SCHOOL HOUSE HEATING AND VENTILATING

By J. H. Kinealy

(*Concluded*)

When considering a system of ventilation for a school building, it will be found that there are certain requirements which a perfect and proper system should fulfill just exactly as there are certain requirements which the heating system should fulfill, and so far as the system fails to fulfill these conditions it must be considered imperfect. The requirements which a proper system of ventilation for a school building should fulfill are four in number as follows:

1. The apparatus should be able to supply to each room not less than 30 cubic feet of fresh air for a child per minute, or 1,800 cubic feet per child per hour.

2. The apparatus should be able to supply a uniform amount of air per minute to each room irrespective of the temperature of the air outside, or of the direction and velocity of the wind.

3. The apparatus should be able to give a uniform supply of air per minute to each room irrespective of the demands on the heating system for heat.

4. The apparatus should be able to supply to each room the required amount of air without creating any uncomfortable and annoying drafts.

The first requirement, which is that the apparatus should be able to supply to each room not less than 30 cubic feet of fresh air per child per minute, or 1,800 cubic feet of air per child per hour, is probably the easiest of the four requirements to fulfill. It is a comparatively easy matter to design an apparatus that will supply 30 cubic feet of air per child per minute to each room, becase this simply means blowing in a lot of fresh air. Thirty cubic feet of air per minute per child may be considered as the minimum amount of air that should be supplied to a school room. This is the standard that, through a sort of evolution, has become adopted in the United States as the standard of ventilation for school buildings. The adoption of this standard has been brought about largely by the efforts of the late Rufus R. Wade, chief of the Massachusetts District Police, as it was the standard adopted by him for the State of Massachusetts and has since become generally accepted as the standard for other parts of the United States. In some parts of the country the standard of ventilation is somewhat larger, being 2,000 cubic feet of air per hour, instead of 1,800 cubic feet per hour or 30 cubic feet per minute.

It should be remembered that 30 cubic feet of air per minute, or 1,800 cubic feet of air per hour, must be considered as the minimum amount which should be supplied and not a maximum, and it is always well to supply as much more air than 30 cubic feet per minute as the circumstances will admit of.

The second requirement, which is that the apparatus should be able to supply a uniform amount of air per minute to each room irrespective of the temperature of the air outside or of the direction and velocity of the wind is one which gravity systems of ventilation seldom fulfill. It is not impossible to lay out a gravity or natural system of ventilation that will comply with this condition, but such systems are seldom laid out so that they do comply with this condition. If the supply of fresh air is dependent upon the temperature of the air outside, it will usually be found that in warm weather the supply of air to the rooms is less than in cold weather, and as a result the amount of air supplied when it is not very cold outside will often be less than 30 cubic feet per minute, or 1,800 cubic feet per hour, with the result that the system of ventilation will comply with the first condition in cold weather and fail to comply with it in weather when it is moderately warm.

It is true that when the temperature of the outside air will admit of it there is no better or more efficient method of ventilating than simply opening the windows and allowing the air to blow through. This, however, cannot be done when the air outside is at all chilly.

If the supply of fresh air is not independent of the direction and velocity of the wind, it will be found that some of the rooms will at times be getting more air than is necessary and others will not be getting the proper amount, and it will also be found to be exceedingly difficult to regulate with any degree of uniformity the amount of air passing into a room, because when the wind is blowing from a certain direction and is strong, the amount of air passing through the fresh air inlet will be usually much greater than that which will pass when the wind is blowing from some other direction or blowing from the same direction with a less velocity. Furthermore, whenever the supply of air is not independent of the outside temperature, and especially of the direction and velocity of the wind, it will be found exceedingly difficult to adjust the apparatus so that each room will get its proper amount of air.

It is in respect to this second requirement that natural or gravity systems of ventilating usually fail and are therefore to a certain extent imperfect. It is not, however, to be understood that it is impossible to lay out a gravity or natural system that will comply with this second requirement, but it is extremely difficult to do so.

The third requirement, which is that the apparatus should be able to give a uniform supply of air per minute to each room irrespective of the demands on the heating system for heat is the one which often induces engineers to make the ventilating system entirely separate and distinct from the heating system. If the supply of air for ventilation is not independent of the supply of heat, it is evident that any change in the supply of heat means a corresponding change in the supply of air, so that in very cold weather, or when the heat given to the room is increased, the amount of air is increased, and in comparatively warm weather when the supply of heat to the room is decreased, or even in cold weather when the supply of heat be decreased, there is a decrease in the supply of air for ventilation. In buildings that are heated by ordinary hot air furnaces, where the supply of heat is determined by the amount of air which enters, as well as by the temperature of the air, this third requirement is seldom fulfilled, with the result that whenever in an attempt to regulate the temperature of the room the supply of heat is decreased or shut off entirely, the air supplied for ventilation is decreased below what it should be or is shut off entirely. The result is that in rooms where this third requirement is not fulfilled there is usually a feeling of closeness and often a very perceptible odor at times when for the instant there is a sufficient amount of air coming into the room. The closeness and odor both being due to the fact that the supply of air had been at some previous time decreased below what it should have been or was entirely cut off. It is impossible to have a satisfactory system of ventilation where this third requirement is not fulfilled, and there is really no excuse for this requirement not being fulfilled, because it is probably, next to the first requirement, the easiest of the four to fulfill.

The fourth requirement, which is that the apparatus should be able to supply to each room the required amount of air without creating any uncomfortable or annoying drafts, is probably the most difficult of all the requirements to fulfill. It is often impossible to lay out a system of ventilation that will fulfill this fourth requirement. This is especially true in school rooms where a large number of pupils are crowded into a comparatively small room. It is almost impossible to avoid drafts when the air of the room must be changed as many as 12 or 14 times an hour and

when the air enters, as it usually does in most school rooms, through one inlet. If 1,800 cubic feet of air per child be supplied to a school room per hour it is almost necessary, in order to avoid drafts, that at least 150 cubic feet of space be allowed in the room per child, since 150 cubic feet of space per child changed 12 times per hour means 1,800 cubic feet of air per child per hour. It is because of this difficulty of avoiding drafts that in most school rooms that are supplied with 1,800 or 2,000 cubic feet of air per child per hour the space allotted to each child is between 180 and 225, making the changes of air per hour 8 or 10 instead of nearly 12. When the air enters at a temperature that is equal to or less than the temperature of the room, it is much more difficult to avoid a feeling of draft than when the air enters at a temperature greater than that of the temperature of the room.

When the air enters with a velocity greater than 600 feet per minute it is extremely difficult to avoid some feeling of draft, especially if the amount of air entering be large and the number of times of air in the room is changed be more than 10 or 12; and air at a temperature of about 60 degrees when blown into a room in which the temperature is about 70 degrees, is likely to cause uncomfortable, or at least annoying, drafts, even when the velocity with which the air enters is comparatively low. Again it is extremely difficult to avoid drafts when the air is blown into the room from two or more places in such a way that the streams of air come in contact and interfere with one another. In such a case there is certain to be a descending current which will be uncomfortable to those sitting under it.

Keeping these four requirements, which should be fulfilled in a proper system of ventilation in mind and remembering that air is an extremely difficult substance to handle because of its lightness and the ease with which it is put in motion, it becomes evident that to lay out a proper system of ventilation is not so easy as might at first glance appear. The result is that there are many school buildings in which the ventilation is not all that it should be, or at least not all that would be ordinarily desired. The difficulty of laying out a ventilating system is very much increased by irregular shapes of rooms and by having to convey the air from a central portion of the building to a room or set of rooms that is far distant. In other words, it is easier to ventilate a building that is compact in the arrangement of its rooms and which occupies a smaller area of ground than it is for a building that is irregular in shape and distributed over a large extent of ground, and it is easier to ventilate a tall building, one having several stories, than it is to ventilate a low building, one having only a few stories.

INDOOR HUMIDITY*

By Henry Mitchell Smith, M.D.

(*Concluded*)

The winter of 1902 and 1903 was occupied in taking records and observations in rooms in which an experimental moistening apparatus was attached to a radiator. The mechanism was such that the control of the temperature and of the moisture were independent, a most important point, and observations were made at different temperatures and with varying percentages of humidity.

These tests were most instructive. In the first place it was observed that with a proper percentage of moisture 70° F. was uncomfortably hot, 68° F. warm and 65° comfortable. By proper percentage of moisture is meant one

*Read in abstract before the Brooklyn Medical Society, May 15, 1903.

which is never below 50 per cent. or above 70 per cent.—average about 60 per cent.

It was determined by repeated experiments that a temperature of from 65° to 68° and a relative humdiity of 60 per cent. produced the most comfortable conditions, which were in marked contrast to a temperature of 72° F., with a relative humidity of 30 per cent. The former felt warm and balmy, the latter, notwithstanding the higher temperature, chilly and dry, and the slightest motion of the air suggested a search for the source of suspected draughts.

Moreover, properly moistened indoor atmosphere lacks all the oppressive dry feeling so characteristic of the average artificially heated room, seeming more like the corridor of a well ventilated hotel. The quieting effect of such an atmosphere is striking. There is an indescribable sense of relaxation and "poise," contrasting strongly with the feeling of nervous tension so frequently experienced in overheated dry rooms.

It was satisfactorily proven that one may live during the coldest weather with perfect comfort in a room at 65° F. where the relative humidity is kept at about 60 per cent.

During the experiments upon the sensations produced by different percentages of saturation and in order to obtain the opinion of persons having no knowledge of the existing conditions one room was equipped with a moistening apparatus and the temperature kept at 65° to 68°, with a relative humidity of about 60 per cent. An adjoining room, without a moistening apparatus and heated by an ordinary steam radiator, had an average temperature of 72° to 74°, with a relative humidity of 30 per cent. In every instance, and without at all knowing what the temperatures were in the two rooms, the opinion was unhesitatingly expressed that the first room was several degrees warmer than the second.

It has been mentioned that the feeling of comfort was greatest in a room at 65° with a relative humidity of 60 per cent. produced by artificial means. It was most interesting and instructive in connection with this matter to find, on the perfect days in May and early June, with all the windows opened, admitting freely the outside air, that the thermometer stood at 65° to 68° and the hygrometer registered about 60 per cent. relative humidity. A moment's thought recalls the fact that we often sit out of doors with perfect comfort at a temperature that would cause us to shiver in our rooms in the winter. The relative humidity is the balance-wheel that regulates our comfort at different temperatures in still air.

So repeatedly was this demonstrated that it may be accepted as a cardinal rule that if a room at 68° is not warm enough for any healthy person it is because the relative humidity is too low, in which case the procedure is to raise the relative humidity and not raise the temperature. By raising the temperature we shall simply still further distort an already unnatural relation between the temperature and the moisture, which is the real source of the discomfort.

It seems well at this point to digress from our immediate subject and attempt to analyze certain outdoor conditions that upon hasty consideration appear to conflict with the statement that "indoors we may be more comfortable at 65° than at 72°, provided the relative humidity is sufficiently high in the former instance."

The argument that is immediately brought up in refutation of the above statement is "that it is well known that cold weather is much more easily borne if the humidity is low than if it is high," which one must admit; but such sweeping, unqualified statements are scientifically meaningless, for it is equally true, using the same loose form of expression, that hot weather can be borne better if the humidity is low than if it is high. We should clearly define in each instance what we mean by the terms damp and dry, hot and cold.

The outdoor atmospheric conditions to which it is desired to draw special attention are of frequent oc-

currence along the North Atlantic coast in the winter. They are the so-called "raw" days, which the records show have not only higher air temperature, but also a higher relative humidity than the bracing clear and dry days which usually precede them. Yet on such days the cold seems much more penetrating. For example, in the vicinity of New York a temperature of 20° to 24° with a relative humidity of about 65 per cent., little or no perceptible wind and a clear sky, are conditions under which one does not feel the cold nearly so much as when the weather moderates, the temperature mounts to about the freezing point and the relative humidity is usually between 80 per cent. and full saturation.

The important fact to note here is that the relative humidity is higher and at the same time the temperature has risen, indicating a much greater absolute humidity; for if there were not more moisture in the air by weight (absolute humidity) the relative humidity must have fallen when the air temperature rose. This higher absolute humidity is usually occasioned by winds that blow from the sea, for almost invariably on these raw days there is a strong east or northeast wind.

To analyze the problem of our sensations under the above conditions we have several factors to consider, the most important of which is the great difference between the effect of air which is in rapid motion and that of air which is relatively still. A higher absolute humidity in connection with greater air motion gives a condition that is most favorable for the rapid abstraction of heat from the body by convection.

In most text books on climatology the term "conduction of heat" is used where "convection" is really meant. In the strict scientific sense of the term conduction of heat through gases is almost nil, gases being the poorest conductors of heat, liquids better and solids the best.

But aqueous vapor is one of the best gaseous absorbents of heat; therefore the loss of the body heat by convection is very great if the absolute humidity is high and the air is in motion. This accounts in the main for the greater feeling of cold on these raw days.

A practical point here is that on such days the warmest outer garment one could wear would be of some waterproof material, in preference to the ordinary woolen overcoat, of greater weight, because we should interpose a more perfect barrier between our bodies and the vapor-charged air, with its heat abstracting powers.

Body heat is lost through the atmosphere principally in two ways—by convection and by surface evaporation. Out of doors in winter loss by evaporation is of relatively little importance because of the protection afforded by our heavy clothing; but it becomes of greater importance in summer, when because of the higher air temperature we wear lighter clothing of such texture that the skin of the entire body is practically exposed to the air, and we endeavor as far as possible to take advantage of the loss of heat caused by surface evaporation.

The heat absorbing properties of moist air in rooms operates directly to the advantage of the occupants, because the air is relatively still. We furnish, by artificial means, heat to keep the temperature of the air much nearer the temperature of the body than is the air out of doors, and a reasonable percentage of moisture (60 per cent.) in a room at ordinary temperature conserves the heat supplied by the heat source. During my experiments it was very noticeable how much more uniformly heated seemed all parts of the room in which there was sufficient moisture than when no moisture was artificially supplied. Under ordinary conditions of heating the uncomfortable difference in temperature between the parts of the room that are near and those that are remote from a radiator is familiar experience.

It is inconceivable that with otherwise perfect means of heating, provision for producing sufficient mois-

ture to maintain a higher relative humidity should have been so disregarded in all but those elaborate systems applicable only to large halls and public buildings, where with forced ventilation the air may be moistened in the main air ducts. But these systems, from the expense of installing and operating, are impractical in the ordinary home, thus leaving the great majority of us to live in an atmosphere of desert dryness, and depriving us of an element almost as necessary for health as a proper degree of heat.

That we are wasting fuel is evident at once from the unnecessarily high temperature we maintain. The waste is probably greater than is generally supposed. Wilson says in the paper to which I have referred that "about 25 per cent. of the cost of heating is expended in raising the temperature from 60° to 70°, so if we can keep comfortable at a temperature of 65° we shall have saved at least 12½ per cent. of the total cost of heating.

Various instruments may be used to determine the relative humidity, the wet and dry bulb thermometers being perhaps the most accurate; but for household purposes this form of hygrometer has the disadvantage that the relative humidity is not indicated directly, but reference to tables or else a somewhat complicated calculation is required. It has one point of considerable scientific interest, however, for the reading of the wet bulb thermometer is a very fair measure of the temperature that is felt by the moist surface of the body; that is to say, the temperature produced by evaporation (which is always lower than the air temperature, unless the aqueous vapor is saturated). In an interesting paper on this subject Prof. Harrington, of the Weather Bureau, has termed the temperature produced by evaporation "sensible temperature," because it is the temperature actually felt by the surface of the body.

Now, given a room at 72° with a relative humidity of 30 per cent. and another room at 65° with a relative humidity of 60 per cent. the sensible temperature in each case can be determined from the psychrometric tables, and we find that in the first instance the sensible temperature is 55° (wet bulb) and in the second instance the sensible temperature is 57°, showing that the body surface temperature is 2° higher, at 65°, with a relative humidity of 60 per cent., than at 72°, with a relative humidity at 30 per cent.

A careful study of the fluctuations in the wet bulb thermometer, having in mind this term, "sensible temperature," shows that sensations of heat and cold conform much more closely to the readings of the wet bulb than of the dry bulb, as the following instance will illustrate. On a very hot day in May, 1903, at 4.45 P. M., the dry bulb (air temperature) stood at 87°, and the wet bulb (sensible temperature) at 70°. The relative humidity indicated by these readings was 45 per cent. (unusually low for this locality). At 5 P. M. there appeared indications of an approaching thunder storm, which, however, passed around to the north and only a few drops of rain fell; at 5:15 the impression was that it had become very much warmer, but the thermometer showed 86° dry bulb, and 73° wet bulb (relative humidity 53 per cent.). The air temperature was actually 1° lower, but the sensible temperature was 3° higher, which exactly coincides with one's sensations.

The above is so common in summer that every one will have experienced the feeling of greater heat whenever a thunder shower fails to clear the air. We say in explanation that the humidity is higher, which is true, but the above figures show how much more graphically the actual conditions are represented by the readings of the dry and wet bulb thermometers than by expressing the relative humidity in per cent. The surface of the body is analogous to a wet bulb thermometer and the term "sensible temperature" deserves a prominent place in our nomenclature.

The lowering of the "sensible temperature" by a low relative humidity is of special importance in children's

nurseries—a fact that has not been sufficiently recognized. Children and babies habitually uncover themselves in bed, thus exposing their bodies to the chill produced by excessive evaporation from the skin. This would seem to account for many of the colds and bronchial affections that children and infants contract in rooms where the temperature has been kept sufficiently high. If a proper relative humidity were maintained uncovering the body would be attended with less risk. It is easier to "take cold" in a room at 72° with a relative humidity of 30 per cent. than in a room at 65° with a relative humidity at 60 per cent.

A reliable hygrometer should be in every household and should be watched to see that proper conditions are maintained. An instrument for registering the percentage of moisture is as important as an instrument for registering the temperature; perhaps more so, for with a proper percentage of saturation of the aqueous vapor we may more safely trust to our feelings of comfort regarding the temperature.

For practical purposes the hair hygrometer, or Lambrecht's polymeter, is a most satisfactory instrument, combining as it does a thermometer and a dial from which the percentage of relative humidity can be easily read. Comparison of one of these instruments for over a year with the calculations made from the readings of the wet and dry bulb thermometer has shown it to be very accurate.

In sanataria there is a wide field for the investigation of the subject of indoor humidity. Certain classes of cases, particularly those of nervous exhaustion, we know do better in a comparatively moist climate, such for instance as that of Atlantic City, while others do better in a drier climate like that of Denver. If the indoor relative humidity could be controlled and its relationship to temperature varied we might in these two factors approximate different climatic conditions greatly to the advantage of properly selected cases.

The importance of indoor humidity from a hygienic and therapeutic standpoint can hardly be overestimated and a paper could be written upon this phase of the subject alone. Generally speaking, dry air is an excitant often causing sleeplessness and irritability, accompanied with a drier skin and quickened pulse. Moist air is more of a depressant, producing quiet sleep and slower circulation of the blood.

Moistening apparatus have been in the main unsatisfactory, because their control has not been independent of the control of the heat source in the room; but instances frequently occur, owing to rapid atmospheric fluctuations, which make it necessary to shut off the production of moisture but at the same time to have full heat in the system. On the other hand, we may wish to shut off the heat, but not the production of vapor. It is absolutely necessary for practice use to have the heating and the moistening apparatus capable of being independently controlled.

It is amusing to find that in spite of the advantages of a moister atmosphere indoors objections have been raised against the use of devices for this purpose on the ground that when the weather is very cold moisture condenses upon window panes. It is true that this will happen; it is a natural and logical result of proper conditions. We can all remember that before the days of heating by direct radiation it was usual to see frost on the window panes in winter, a condition we now never see with the extreme dryness that our present direct heating systems produce. The fact that condensation does not occur is sufficient evidence of the indoor "dryness." However, this objection could be obviated by having double windows, which indeed are common in houses whose situation is at all exposed.

This paper will have failed in its purpose if the impression is given that in any sense it advocates "moist climates." The deleterious effects of residence in the humid tropics are too well known to need more than pass-

ing mention; but from the climate of the tropics to that of the desert is a wide difference; one shuns the latter as much as the former.

When we consider how many are compelled by their occupations to spend a greater part of their lives indoors the desirability of reducing as far as possible the contrasts between natural and artificial conditions is at once apparent. The relative dryness of the average indoor atmosphere in winter is so unnatural and so unhygienic that its correction should receive the serious consideration that the subject merits.

We who live in houses heated in the ordinary manner are responsible for the conditions that prevail, because we have not demanded more hygienic methods. If the subject does not appeal to us upon the ground of health it should upon the ground of economy and comfort. If we would preserve our furniture, books, pictures, etc., from the ravages of artificial heat we must contrive some means of controlling this low relative humidity. After living in rooms with a lower temperature and proper relative humidity no one will be satisfied with the other conditions.

When Sales Don't Belong to the Salesman; How Personal Touch and Attention Keep Things Going

Any business man, says System, who stands in terror of his salesmen because they "sell the goods" might do well to wake up to the fact that it is his own fault if salesmen, when they leave him, can carry an appreciable amount of business to a competitor. A salesman may hold trade by courtesy and favors, but an intelligent sales manager and a wide-awake advertising department can create such a favorable impression for the house that customers in the remotest corners of the earth may soon be made to feel personally acquainted with the concern—can be made to feel that it is the particular business of somebody to sit at a table in the main office and attend to their individual needs. This is accomplished not only by prompt and careful attention to inquiries and orders and by systematically following them up, but also by frequently sending special literature and an occasional letter or mailing card.

When the individuality of a concern has become impressed upon a customer who receives good treatment, the call of a competitor's salesman will seldom carry away the order, especially if a neat little reminder happened to drop out of the morning's mail. And these same ties of personal touch with the home office are what will hold business when the best of salesmen go over to a competitor.

Business should be built for the future, not for the moment. The success of a house should not rest upon the shoulders of one man, or of any number of men. A proper organization lives and grows beyond the coming and going of men.

The loyal salesman glories in the permanent organization of his house. He is one with the firm—may become a part of it some day; he is working for the firm, not for himself. Both for its effectiveness in establishing intimacy between the house and his customers, and for its immeasurable help in keeping business moving throughout his territory while he travels from point to point, and because, as he goes, he can actually see the good work go on, the traveling salesman appreciates, perhaps more than anyone else, the importance of direct methods in advertising and of systematically "keeping at it."

It not only sells goods when he cannot be on the spot, but the little pamphlets and other special missives send the arguments on in advance, and a man will often read when he will not listen. The result is that the salesman has fewer obstacles to overcome, is saved many an argument, makes more sales and makes them easier, all because of the kindly aid of systematic advertising—direct.

What the Trade Journal Can Do for You

By R. A. Halley,

In the "Trades Press List"

The trade journal is a necessity to the business man who adopts business methods in conducting his affairs. It is a necessity if he would get out of his business all the benefits that it can give him, and if he would preserve his standing in the industry with which he is identified. In this day and time the business man does not often ask how the trade journal can help him, but sometimes, unthinkingly, he does ask the question.

In the first place, the trade journal can help the business man by keeping him advised of the state of his branch of business and its ever-changing conditions. It can bring him every week a composite photograph, as it were, of the entire industry and enable him to guide his own course by what others are doing, and by the existing conditions in the business he follows. The trade journal can thus keep him in touch with all whose interests are identical, and whose business interests fail or prosper with his own. Conditions

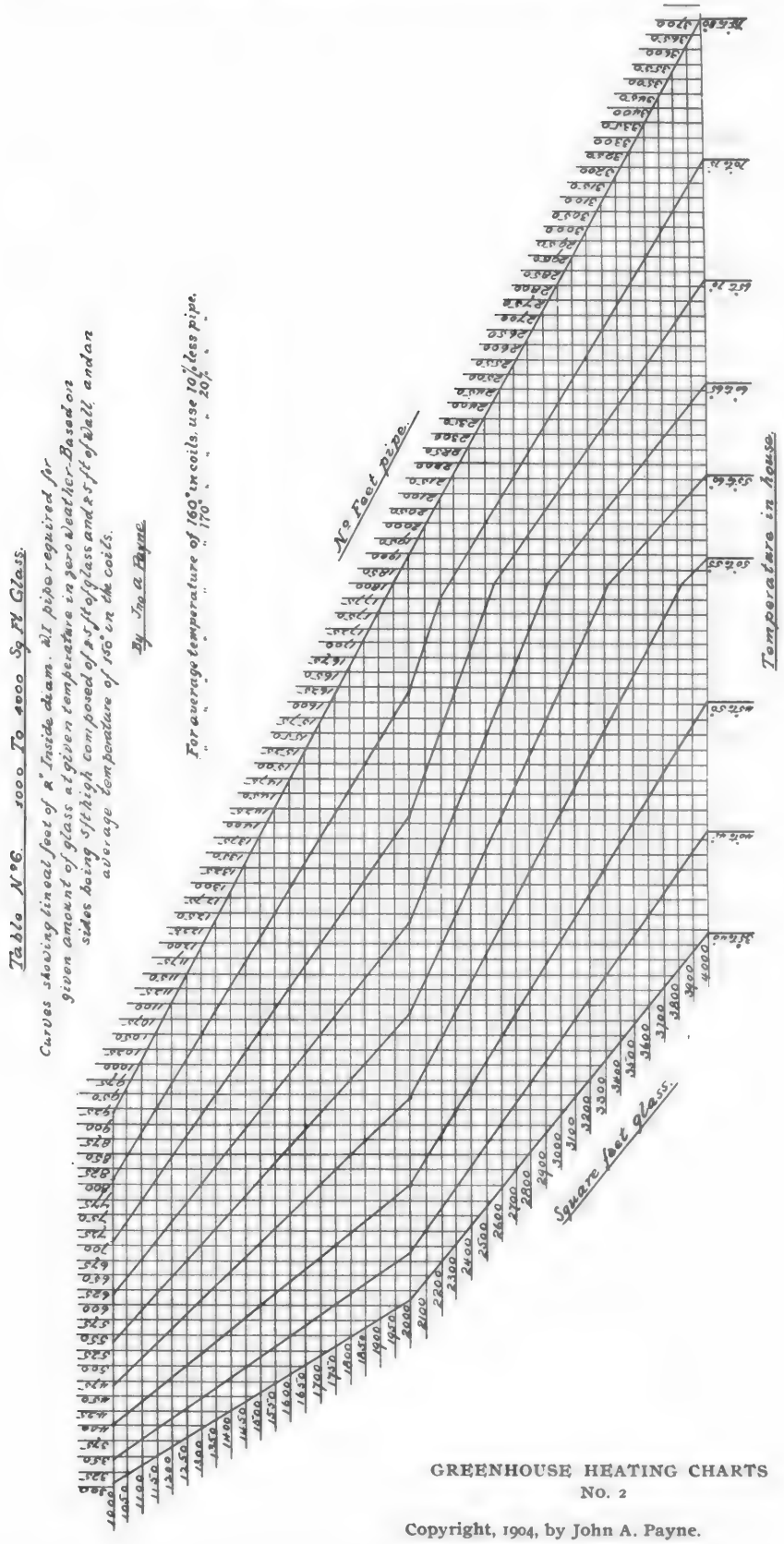


Table N°6. 1000 To 4000 Sq Ft Glass.
Curves showing lineal feet of 2" Inside diam. Ht pipe required for given amount of glass at given temperature in zero weather. Based on sides being 5ft high composed of ½ ft of glass and ½ ft of wall and an average temperature of 150 in the coils.
By John A Payne.
For average temperature of 160° in coils, use 10% less pipe.
" " " " 170° " " 20% " "
N° Feet pipe.
Temperature in house.
Square feet glass.

GREENHOUSE HEATING CHARTS
No. 2

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affecting one are apt to affect all, and if they do not, the reason may be learned from the trade journal. Thus the business man may profit either by the errors of others or by following their successful example. In either event the trade journal is a helper.

In the second place, the trade journal is a vast and powerful influence for good to an industry by the mere fact that it is a dignified representative of that industry at all times, ready to defend its interests, to advocate its rights and to maintain its independence. It is a forum always open to the speaker or the writer who can say something—a potent influence in making known to all the thoughts and purposes of each. In union is strength, in the industry of to-day, as much as in anything to be mentioned. The bond of that union in any organized industry is the properly supported trade journal. Does any one believe that organized labor would be what it is to-day had they no journals through which every union labor organization can reach every other, and all parts of any one organization can be brought in close touch with any other? This is a method of communication organized industry has been slow to learn from organized labor. It is not only necessary to have your own trade journals; it is just as vitally important that the people in that industry properly support them when they have them. The standing, dignity and importance of an industry can be fairly judged by its trade journals and the manner in which they are supported.

In the third place, the trade journal aids an industry by bringing the men engaged in that industry in close contact one with another, and in creating a community of feeling to back up the community of interests. Where men keep in close touch and understand each other, they more readily work for the common good. Petty rivalries disappear in the general interest in behalf of the industry itself, and every man reaps the benefit. Business jealousy is not competition, for competition may and does exist absolutely apart from petty jealousy. The fight for trade is honorable and competition is a factor of life and strength in a business, where small and mean jealousies only destroy. The trade journal inspires broader-mindedness, a wider and more comprehensive way of viewing things, and so inures to the benefit of the industry, and of the men engaged in it.

In the fourth place, the trade journal can help every man in the industry by informing him of the progress made by others in his business, of their discoveries, and of their successful or unsuccessful experiments at improvement. The true trade journal being the forum, the vehicle of communication between all engaged in the industry, there is not one of them but can add his contribution to the aggregate knowledge of all. That knowledge may be technical or practical, but whichsoever it may be, the trade journal is thereby made helpful to every other reader, by reason of its containing that knowledge. Every week the trade journal comes with its burden of news and suggestions to the reader who is ready to receive it.

The trade journal as an aid to an industry is an acknowledged power, and no one acknowledges this power more fully and more freely than the best and most successful men in the industry. They take their trade journals and advertise in them, and they read them. The trade journal does not reach so many as the daily papers, but the trade journal goes to people who are especially interested in the industry it represents. Its space is more valuable on that account. In the case of "Fuel," there are cases where a few dollars spent in advertising brought almost immediaely many thousands of dollars' worth of business.

The trade journal can help you because of the personal interest taken in the subscriber or advertiser, and of the assistance readily and voluntarily given both. It is not like the impersonal daily or the literary magazine, with its hundreds of pages of advertisements, and does not leave the printed advertisement to do its own work alone. Where business can be sent to the advertiser, the trade journal finds a way of sending it. The trade journal is not an outside element, but a living and effective factor in the industry it represents and advocates. It can help, it does help, in many ways, the advertiser and the subscriber.

Even Politicians Are Gaining Courage

The excesses of labor unions and their claims to exemption from legal restraint in assailing the rights of others, says the New York Journal of Commerce, have opened the eyes of the people and produced a radical change in the attitude of the public mind toward them. Even politicians are gaining courage to resist the outrage upon the very principles of free government. It is a hopeful sign and should have the effect, not of destroying organization of labor, but of bringing it under the same subjection to law that any other form of organization has to submit to, and teaching it that the common rights of person and property cannot be trampled upon by organized labor any more than by organized capital, or organized brigandage.

The trade and technical press is practically the outgrowth of a demand for information along specific lines which was not filled by the metropolitan press, and which has grown into such a necessity that it has become the very life principle of trade and commerce throughout this country and the world.—Trade Press List.

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THE special features of the National Convention, aside from a disposition to act rather more aggressively in the matter of increasing numerical strength, are embodied in the various reports.

Secretary Gombers shows that infractions of the trade relations are decreased, being only twenty-five during the past year as against forty-seven for the previous year.

The reduction of the initiation fee is of importance in the getting of new members. It is not very large now, but a smaller fee will doubtless appeal to a great many possible members.

The prosperity of the Association is shown by the practical abolition of the Committee on Ways and Means. The committee still exists as a sort of the "Good-of-the-Order" Committee, but its old functions have been rendered unnecessary.

PRESIDENT HALL'S address has two points of interest and merit not always found combined in the rather perfunctory performance of producing a president's address for any kind of an organization.

Mr. Hall's production has good literary merit and it is full of meat.

For example, there is the idea strongly expressed that the Association should contain only the best men. In this particular association there never has been any criticism on that score, but now they are planing to enlarge their membership and it is well for them to bear in mind that in certain other organizations there has been some lack of attention to the character of members and the quality of their individual work.

We have had frequent occasion to take the position that such an organization as this should make it manifest to everybody that membership means reliability, first class work and square dealing. That is what President Hall calls for by implication. It should be so true as to be beyond question that every man wearing the button of the Association has been tried and proven, and that he has demonstrated beyond all doubt the knowledge, the skill and the integrity needed to make him a safe person to whom to intrust the execution of a piece of work.

When this Association shall have a large membership grounded upon such lines they will have pretty nearly solved their problem. As soon as that condition becomes generally recognized the first question the careful house owner or architect or an honest builder will ask is, "Do you belong to the National Association? If so, all right; if not, all wrong and no bid is acceptable." That will bring in the desirable members pretty promptly and suppress the activity of undesirable men.

All this is not so easy as it may sound. A man cannot demonstrate his swimming ability if the pond is fenced off, and the Association would have to show a pretty liberal spirit in giving would-be members a

chance to show what they are made of.

On the other hand, they can not be so liberal as to become careless. Then they would simply achieve numerical strength at the expense of quality.

By making very serious mistakes either way it would be pretty easy to manage things in such a manner that the people of some city would some day wake up to the fact that the majority of the capable men were outside the Association and then anarchy would begin all over again.

The idea, however, is correct and a man's membership certificate should entitle him to the confidence of any prospective customer.

WHAT Dr. Smith says in regard to "saturated" vapor in his article on Indoor Humidity will be read with a good deal of interest because it embodies what to many will be a new idea; at least it will strike many as new. Objection will probably be urged against what he says on the ground that he is attempting to give to the word "saturated" a rather new and unusual meaning. It would seem further that instead of simplifying the ideas in regard to moisture in the air he complicates them by the use of new phrases. Dr. Smith thinks that the words, as ordinarily used to explain the presence of moisture in the air, are not properly used or are not expressive enough, and he wishes therefore to introduce a new phrase. Admitting for the moment that he is right in what he says, there is the difficulty, which we think will be hard to overcome, of getting people to use a new and unusual phrase or terminology to express what they may consider an old idea.

EXCEPTION will be taken to another of Dr. Smith's opinions. He seems to consider direct radiation responsible for much that is objectionable in our present indoor conditions. We think most people have found a better atmosphere with hot water heating or even with steam than is commonly produced by the hot-water furnace—and we do not think so badly of the furnace by any means. We are quite ready to accept his proposition that some moisture in the air is necessary, but direct radiators do not bring in any outside air, and such changes of air as are due to cracks around windows and doors are insufficient to remove the moisture from the air in the rooms.

THESE, however, are immaterial details, and the general idea that moisture in a proper degree shall be provided in the atmosphere in which we live is obviously worthy of consideration.

IT is surprising to find that there are people who cling to the old idea that business in a Presidential year must be necessarily bad.

Most people know that this is utterly senseless and that whatever may be the result of a Presidential election it contains no possibility of business disaster that could—certainly none that should—have the least bearing on the year of the election. That has not always been so. In many of the elections of the early part of the last century the issues involved were of such magnitude and the feeling of the opposing parties so intense that wise business men got under cover.

All that is a thing of the past. It may prove a thing of the future, but it is not of the present.

THE most alert scouts searching for symptoms for coming prosperity or depression are perhaps the stock brokers of our large cities. The New York Sun tells the following story of a Wall street broker whose remarks seem to indicate an expectation on his part of considerable dulness for a few weeks and a good deal of activity a little later:

"In our own affairs," said the broker last week, "we find, if we but look for them, all the signs of the times. I decided last year that instead of painting my country house this spring I would shingle it all over. Well, when spring came things looked so bad down here and everybody seemed so blue that I decided to let the shingling wait. There is no reason why I should have delayed it; the cost is not great, but the point is that I did delay it. I should be having it done now, of course, when shingles are cheap and labor is easy to get, but I shall wait until everybody else wants shingling done, until shingles go up and labor is scarce, and then have it done in a hurry. Now, isn't that the way with all of us? If there are a hundred men with country houses around New York waiting to shingle them as I am waiting, there must be tens of thousands in the whole country who are putting off their shingling and that hurts the shingle business."

Almost everywhere this might be applied to the heating and ventilating situation. People with plenty of money are waiting simply because other people talk blue. Those who are waiting know that they are going to pay for their waiting, possibly by advanced cost of labor, quite likely by increased prices of material and certainly by getting rush jobs put in hastily and under great pressure.

This is something that every heating contractor should use as an argument with prospective customers, urging them to get their work started quickly. We have never had a winter when existing heating plants were so thoroughly tried out and so many found wanting. Most of them will be replaced before cold weather, and yet almost everybody is waiting. Some of them, more susceptible to a little argument, are prevailed upon to have their work put in during the summer instead of waiting until they begin to feel the pinch of the cold.

AMID all the talk against union men as men and citizens, one voice has been raised which must command the attention of all of us.

It may be that Secretary Cortelyou is a Democrat undertaking to conduct a Republican campaign, but he certainly talks good sense. In a recent address, he asks us all to remember that the American working man is an American, and a very good American. He is, as a rule, industrious, sober, honest and patriotic. If, at times, and perhaps often, the unions as bodies do things which are subversive of order and contrary to the general welfare, let us remember that such acts are not the acts of individuals, but of organizations controlled more than most bodies are by recognized leaders.

Mr. Cortelyou reminds us that there are plenty of instances of greed, injustice and wrongdoing on the part of employers. This is, unfortunately, true. If we find similar vices among employees we may not for that reason condemn all employees. It is the misfortune of union men that they have been dominated sometimes by men who have no work to do and nothing ready to their hands except to make mischief —mischief for revenue only.

The rank and file simply want work.

SMOKING COMPARTMENT REFLECTIONS

Senator Wray was perhaps the "tickledest" man in New York over the passage of the compulsory ventilation law. Perhaps Superintendent Snyder was equally pleased, but he suppressed his emotion and did not execute a war dance over the telephone.

There was a nice little explosion in Boston a few weeks ago. Is it possible that it was only a few weeks ago when we were all frozen up and making a terrible row about the continued disappearance of the mercury below the bottom of the glass? Anyway, it was pretty cold in Boston once, not so very long ago, and at about the coldest time a handsome house in a fine suburb was badly damaged as to its attic by a fire and the furniture was not improved by a flood of water. The occupants moved out and after a few weeks of below zero weather they, or the insurance men or somebody else, sent a man around to fire up the furnace. It was a combination furnace and no one had taken the precaution to draw off the water from the radiators or boiler, so it was quite fortunate for the fireman that, after starting up a brisk blaze, he went out in the snow to smoke his pipe. Smoking is sometimes a valuable habit. What he heard when he got outside made him drop his pipe, and when he dared to look into the cellar he could not find much of the furnace. There were some fragments of castings scattered around, and some distorted galvanized iron that nad once been a shapely casing. The parlor floor was about five inches higher than the other floors, and a riser was blown through the floor and up into the ceiling where it remained suspended. Every radiator and pipe and fitting in the house was cracked or split, and the plumbing system was in a similar condition.

A prominent heating and ventilating contractor was called upon to look the job over. He asked me what I would suggest as the proper way to arrive at a figure for reconstructing the heating and plumbing apparatus, and got this answer: "Figure up what a new heating and plumbing job would cost, multiply it by three—and then you will probably get stuck."

Harry D. Crane is said to be the worst automobile fiend in Cincinnati, and expects this month to cruise up to the Engineers' meeting at Detroit in his touring car. There is only one contingency that may thwart his plan. When he sniffs the breeze from Lake Erie it is a ten-to-one shot that he will look under the seat and fish out a canoe and set sail for Ballast Island, the headquarters of the canoe club of which he used to be commodore.

W. A. Russell is another automobile fiend and he has been using his fiendishness to make a little money on the side. It is said that when he begins to talk up the merits of the different parts of his machines the victim draws a check at once.

He lately undertook to transport an eastern boiler manufacturer from some point in Detroit to an east-bound train. After keeping his guest so late that he abandoned all hope of getting out of town that night Russell produced a racer and broke all the laws of the State of Michigan and the city ordinances of Detroit — but he caught the train with time to spare.

Heating engineers sometimes get roasted, but a man showed me a letter which he received the other

day which was rather a new one. He had been absent from his office most of the day and when he got back he found this:

DEAR SIR:—

You was not inn but was outside. You are not an inside inn.—no never. We wuz goin to get youse to put in a cistim in our new skool at——but will have to let the contract to a person what is to hum now and then. You are hot air yerself.

Yours truly,

It is funny how some men enjoy a roasting. A celebrated sinner in the boiler business once got by the ears with the foundryman who was making his castings. The foundryman was distinctly displeased and thought it was time to expostulate vigorously. He did this to the limit of the most talented foundryman's vocabulary. Having exhausted the possibilities of the language he paused for breath. Then said the sinner, "What is your arrangement with this company? I could use a man like you to very good advantage in my business."

Two New York men prominently connected with the manufacture of heating and plumbing goods are taking things to restore shattered nerves.

It all happened this way. The other night they started out from some place on Long Island Sound to take a small naphtha boat to a point on the Shrewsbury river, about sixty miles away. They had an East River pilot with them who steered them past the dangers of Oyster Bay, the allurements of Glen Island and showed them where to get a good shore dinner.

Then during the evening they boldly sailed through Hell Gate, kept out of range of the riflemen guarding the city's wards on Blackwell's Island, successfully shot the spans of the Williamsburg and Brooklyn bridges without striking a pier, got away from the harbor police, and late at night struck out across the bay.

Here the East River professional pilot gave up his job and the Shrewsbury amateur took the helm. He squared himself with the quarantine authorities, got through the Narrows without bumping into Fort Lafayette and arrived off Coney Island at an hour when the Dreamlanders were all dreaming.

Sandy Hook was the next objective point and through the small hours of the night they sailed for it. The Shrewsbury man found a nice, attractive looking light which he made his guiding star. After pursuing it two or three hours, he caught it. It was a slow drifting barge, rather uncomfortably far outside of Sandy Hook in the open sea, and our voyagers were on their way to Cuba.

The first step was to perform the mystic rite of throwing a fit. After sufficient perspiration had been shed the usual restoratives were resorted to. Then they turned the boat around and succeeded in getting home in time for breakfast. But now there are gray hairs sprinkled among their youthful locks and the next time they go to sea it will be in a very large boat.

As one looks from the window of the smoking compartment coming into New York over the New Haven road, he sees a very extraordinary advertising sign. On one side of the railway is Woodlawn Cemetery, with its terraced rows of burial vaults. Directly across the track and facing them is an example of art in advertising—artful if not artistic. Cunningly done in boards and paint is a representation of a marble vault with an inner iron door. On the door is the circle-and-cross trade mark of a well-known article of food and the legend, "Inerseal." I wonder if Mr. Adolphus Green, the presiding genius of that company of nutriment manufacturers, gives this his unqualified approval. I likewise wonder what is

thought by the mourners visiting the cemetery.

Hon. James H. Blessing, Albany, is the subject of a recent paragraph in the Mercantile and Financial Times. This tells pretty nearly everything about him excepting that he has been mayor of Albany, which our friend was doubtless too modest to mention, although his election and his administration were alike creditable to him.

What the Times says about the Blessing traps and other specialties is doubtless of interest to the readers of the Times, but readers of this Magazine know all about them.

One of my fellow smokers on the Board Walk at Atlantic City was mildly deploring the fact that when he left home he was without information as to what was going on there until his return.

It came about this way. A few years ago, while traveling in the West, his wife took time to write him a long, newsy letter telling him everything that would be in the least likely to interest him and sent it off in the proud consciousness that she had done a pretty nice thing.

It happened that telegrams from his office made him do some lively shifting of his route, and the letter did not overtake him until he was in Chicago, about ready to start for home. He put the letter in his pocket to read on the train, but found business acquaintances on the train, so the letter was forgotten.

The next day, as his wife was laying out his clothes for the cleaner, she discovered the unopened letter. He does not know, nor will he ever know, what was in that letter and has pretty nearly forgotten what his wife's penmanship looks like.

And now when he smokes up, at Atlantic City or Detroit, he can only make a rough guess as to whether school is keeping or not. He will find out when he gets home.

It was one of those little things that are pretty difficult to explain.

THE SMOKER.

CORRESPONDENCE

Measuring Radiating Surface

Editor HEATING AND VENTILATING MAGAZINE:

Can the actual superficial surface of a radiator be determined by immersion? If so please give rule or formula.

WANTS TO KNOW.

ANSWER.

We think we can guess pretty accurately the personality of our inquirer, and we have told him several times that the so-called method of determining superficial surface is a myth and a delusion. However, he appeals from our judgment and asks for the opinion of our readers, which we shall be glad to receive.

Changing a Heating Coil

Editor HEATING AND VENTILATING MAGAZINE:

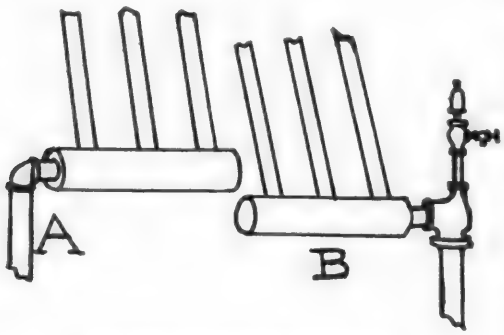
I have a coil for drying feathers on the second floor of a brooder house. It is a hot water coil constructed of six 1½-inch pipes 50 feet long connected to two three-branch headers and connected to the hot water heating system with a 1-inch flow and return pipe. The coil runs horizontally, the high end being farthest away from the headers and during the very cold weather of last winter it did not develop quite enough capacity to properly do its work of drying. As my pans are all made to fit the present coil, I decided instead of enlarging it to change the system to steam and have purchased a small steam boiler of 200 feet capacity and intend to cut off this coil from the hot water heating system and connect it to the steam boiler. I have more experience with hot water than steam and would like your opinion as to whether this will work satisfactorily and what changes if any will be necessary in my coil or mains.

ANSWER

It is quite probable that part of your trouble with the present arrangement of the coil was due to the small size of the flow and return pipe, which is hardly large enough to supply 150 square feet of surface. In addition to this it would have been better in hot water to have fallen from the flow header to the return header, as this would have allowed it to be freed from air through one air valve, while your present arrangement would require three air valves or else air pipes.

Raise your flow header "A" so that it shall be the high point of the coil, all the water of condensation having a downward fall to the point "B", make your 1-inch flow pipe 1½ inches and make your 1-inch

return pipe 1¼ inches. At the point "B" where you drop down from the return header to the boiler put in a tee and carry up a 1-inch pipe about 1 foot with an automatic air valve on top of it. Below the automatic valve it would be well to insert



CHANGING A HEATING COIL

a positive air valve so that you can use it in filling up the coil quickly with steam or whenever for any reason the operation of the automatic air valve is insufficient.

Calculating Loss of Water

Editor HEATING AND VENTILATING MAGAZINE:

I have a conundrum in regard to loss of water from a tank. It is a horizontal cylindrical tank which, when full, holds 4,500 gallons. When it contained 3,000 gallons the water line was 9 inches above the center line of the tank. Water escaped, sufficient to lower the water line 5 inches, and the claim is made that some 2,000 gallons escaped.

I think it was not nearly so much; can you help me out? P. C.

ANSWER

If the tank when full contained 4,500 gallons, it would contain 2,250 gallons when full to the center line, so that if the water had escaped sufficiently from 3,000 gallons to bring it down to the center line, 9 inches below, there would have been a loss of the difference between 2,250 gallons and 3,000 gallons, or 750 gallons. The water line was not reduced 9 inches, but only five inches, and not at the greatest dimension of the tank, so that the actual loss was something less than $\frac{5}{9}$ of 750 gallons. Probably very close to 400 gallons were lost.

A Seeming Discrepancy in Methods of Calculating Radiation

Editor HEATING AND VENTILATING MAGAZINE:

Dear Sir:—Please help a perturbed heating contractor. He was asked to submit bid for a low pressure steam heating apparatus for an opera house. The conditions were as follows:

Cubic contents.....	830,000	cu. ft.
Exposed wall.....	7,500	sq. ft.
Exposed glass.....	1,900	" "
Temperature required.....	65°	Fah.
Lowest outside temperature..	25°	"
Difference	40°	Fah.

The contractor having read an article by Mr. Charles F. Hauss entitled "To Figure Heating Work Accurately," read before the January meeting of the American Society of Heating and Ventilating Engineers, made his bid in accordance with the rules therein given. The result was that the contract was awarded to him; but the architect not having the faith in Mr. Hauss that the contractor had, had doubts as to the sufficiency of the radiation and required an unusually large bond, justifying his action by reference to Professor Carpenter's book.

Mr. Hauss' rule and tables give the required radiation as follows:

Radiation of above opera house for zero, 4,994 sq. ft.; for a difference of 40°, 2,853 sq. ft (that is the radiation required for 25° outside and 65° inside is 2,853 sq. ft.).

Professor Carpenter will give for zero 7,546, which, for a temperature of 65° inside and 25° outside, will give as required radiation 4,075 sq. ft.

Now compare these figures and we get the following:

Carpenter, zero outside 70° inside	7546	sq. ft.
Hauss, zero outside 70° inside	4994	" "
	2552	" "
25° outside 65° inside.....	4075	" "
25° outside 65° inside.....	2853	" "
	1222	" "

a difference of 41 per cent. and 51 per cent. in the two rules.

In working the estimates, according to Mr. Hauss' rules, I simply used the table of constants given by him, as follows:

830,000 cubic ft x 019 x 40 = 630,800 B. T. U.
7,500 sq ft. wall x 10.40 = 78,000 "
1/900 sq. ft. glass x 40 = 76,000 "

784,800 ÷ 275 = 2853 sq. ft.

of radiation required for a difference of 40° between the inside and the outside of house (65° inside, 25° outside).

By Professor Carpenter's rule:

Glass surface

$$(1900) + \frac{\text{Wall}}{4}(7500) + \frac{\text{C C.}}{55}(830\ 000) \times 4 =$$

required radiation for zero outside, 70° inside which, multiplied by .54, gives the required radiation for 65° inside, 25° outside, 7,546 sq. ft. of radiation for zero outside and 70° inside. $7.546 \times .54 = 4.075$ sq. ft. of radiation for 25° outside and 65° inside.

Now, if this is correct, the outlook for the Bond Company is gloomy—very.

Please give this your attention, as the contractor is thinking of moving to some town where he will not see another copy of the Heating and Ventilating Engineers' Proceedings, and does not want to delay his peregrinations long after the first payment on his contract.

I most sincerely hope you will find in your new publication all you anticipate.

PERPLEXED CONTRACTOR.

ANSWER

Your error is that when using the Hauss rule you assumed that the air was changed only one time each hour; while when using the Carpenter rule you assumed that the air was changed four times each hour.

The Hauss coefficient for glass is 1, the same as used by Carpenter.

The Hauss coefficient for wall is 0.26, while Carpenter's is $\frac{1}{4} = 0.25$.

The Hauss coefficient for air heated is 0.019, while Carpenter's is $\frac{1}{55} = 0.018$.

Using the Hauss coefficients the heat lost per hour per degree difference of outside and inside temperature is

$$1900 + 7500 \times 0.26 + 830\,000 \times 0.019 = 19{,}620 \text{ B. T. U.}$$

The heat lost per hour using the Carpenter coefficients, per degree difference of inside and outside temperature is, for four changes of air

$$1900 + \frac{7500}{4} + \frac{830{,}000 \times 4}{55} = 64{,}139 \text{ B. T. U.}$$

For one change of air per hour the heat lost per hour per degree difference between the inside and outside temperature by the Carpenter coefficients is

$$1900 + \frac{2500}{4} + \frac{830{,}000}{55} = 18{,}866 \text{ B. T. U.}$$

In addition to assuming four changes per hour of the air when using the Carpenter coefficients, you seem to have made some arithmetical error, as we do not get the same result you do from the figures given.

To get the heating surface it is necessary to multiply the difference between the inside and outside temperatures by the heat lost per degree difference and then divide this product by the heat emitted per hour per square foot of radiating surface.

You assume in making the calculation when using the Hauss coefficients that 275 heat units will be emitted by one square foot of surface. The difference between the inside and outside temperatures is 40. Hence for one change of air we have the heating surface required.

By the Hauss coefficients

$$\frac{19.620 \times 46}{275} = 2850$$

By the Carpenter coefficients

$$\frac{18{,}866 \times 40}{275} = 2740$$

Using the Carpenter coefficients and assuming four changes of air as you seem to have done, we get

$$\frac{64{,}139 \times 40}{275} = 9320$$

How many times the air in the building is to be changed depends upon the ventilation provided. One change of air means 830,000 cubic feet of air per hour, which is 2,000 cubic feet per hour each for 415 people. And four changes per hour means enough air at the rate of 2,000 cubic feet per hour per person for 1,660 people.

It is probable that unless some scheme of ventilation is provided the air in the building will not be changed one time an hour, and unless the building is very poorly constructed one change is more than ample.

You do not say how thick the walls of the building are nor of what they are made, neither do you say anything of the roof, which may have to be counted as wall if there is no attic. We judge, however, from the coefficient you have used that you have 16-inch brick walls.

Congratulation

United States Heater Company,
New York, June 22, 1904.

My Dear Mr. Smith:

A copy of the first edition of your paper reached my office some days ago. I have read it through with a great deal of interest and wish to congratulate you on the breezy and entertaining nature of the editorial pages, as well as the several interesting articles by engineers. The numerous advertisements are evidence of your successful canvass of the manufacturers.

Very sincerely,
H. H. HESS.

Another Compliment

International Heater Company,
Utica, N. Y., June 21, 1904.

Mr. H. A. Smith,
1123 Broadway,
New York.

Dear Sir:

We think you did very well indeed in the June number, and hope that you will be successful in your undertaking.

Yours truly,
INTERNATIONAL HEATER CO.,
F. H. Moore, Treasurer.

Substantial Appreciation

H. A. Smith, Esq.,
New York.

Dear Sir:

The HEATING AND VENTILATING MAGAZINE is exactly my idea of what such a paper should be.

If you will send me twenty-five copies and twenty-five subscription blanks I will

shortly send you $25 for subscriptions, and after that I shall want more.

The size and style of the paper and the character of its contents make me feel that you have struck the right thing.

Yours truly,

Manager Boiler Department.

Western Trade Golf Association

The western golfers met at the Glen View Country Club, June 24, immediately after the joint meeting of the Supply Association at Niagara Falls.

The qualifying round showed the following results:

J. B. Rahm	48
John D. Hibbard	48
George F. Hughson	52
John Duncan	59
H. I. Lord	67
D. E. McCabe	69
John K. Allen	64
F. C. Hill	56
C. L. Williams	56
H. E. Pursell	62
D. C. Chaddock	63
W. Clark	54
J. C. Bannister	48
J. D. Purdy, Jr	79
W. A. Cameron	58
J. P. Dugger	50
H. Whitney	66
J. W. Story	84
S. O. Dugger	49
H. B. Clow	50
Charles K. Foster	51

The afternoon play was arranged as follows:

First Flight—J. C. Bannister, John D. Hibbard, Sam Dugger and J. B. Rahm. The first prize, a silver flask, was won by Sam Dugger, the runner-up prize, a scarfpin, going to J. C. Bannister.

Second Flight—H. B. Clow, J. P. Dugger, Charles K. Foster and George F. Hughson. The first prize, a silver tankard, was captured by George F. Hughson, while the scarfpin, for the runner-up, was won by J. P. Dugger.

Third Flight—W. Clark, C. L. Williams, F. C. Hill and W. A. Cameron. The first prize, a walking stick, went to W. Clark, and the scarfpin, for the runner-up, to W. A. Cameron.

Fourth Flight—John Duncan, H. E. Pursell, D. C. Chaddock and John K. Allen. The first prize, a smoking set, was won by D. C. Chaddock, John Duncan getting the scarfpin for the runner-up.

Fifth Flight—H. Whitney, H. I. Lord, D. E. Mecabe and J. D. Purdy, Jr. There was but one prize, a large silver corkscrew, which was won by H. I. Lord.

As will be seen, the interest of the Western Trade Golfers is fully equal to that of their friends in the East, and all are hoping for a team match at some intermediate point between the two associations during the season.

NEW DEVICES

Ideal Laundry and Tank Heaters

The little water heaters which we herewith illustrate are designed to produce

FRONT VIEW

a sure, handy and economical means of heating and circulating water for laundering and other purposes of the household which require flatiron heating in the laundry room, and water hot and plenty in the bath room, pantry, kitchen, toilet and other rooms.

This heater provides an improved form of flat-iron heating service for domestic use or for any other uses which require this combination of utilities.

It presents a large, double-griddle top for the specific purpose named or for any other special heating service requiring such exposure to heat—such as for wash boilers, preserving kettles, etc.

The various features of value presented in this Ideal Laundry and Tank Water Heater will commend it to house owners, hotel and restaurant keepers, laundry proprietors, to hospitals and other public and private institutions as being a most superior heater for laundry purposes.

As in all types of Ideal Heating Boilers and Ideal Tank Heaters, these Laundry Heaters are well proportioned—of neat and pleasing design.

All parts are interchangeable. New parts will fit perfectly. They reflect in general features the best ideas necessary to the making of modern apparatus for hot water service and iron heating.

Every part is placed where it will do the best work—surely and economically.

They are made from superior grades of cast iron and of mixtures of materials which have been thoroughly proven by careful fore and after tests as best for the purpose.

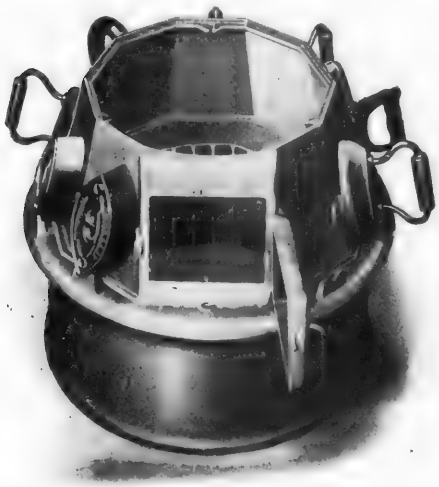
The pot, as shown in the engraving, is provided with inner ribs for standing the coal away from the pot side so as to make channels to pass air up into the pot and fire chamber. This inlet supply increases the intensity and value of the combustion, giving the fuel at the edges a livelier incandescence and causing a larger consumption of the gases. This intermixture of air produces the best results in fuel burning and passes a larger degree of heat to the water and flat-iron heating surfaces.

The pot is deep and has ample holding capacity for coal, without often refeeding.

The pot is hollow, thus forming the water heating cylinder. It is tapped for one inlet at the bottom and one outlet at the top.

The lower iron-heating surfaces as shown herewith are in the form of a decagon, nine sides of which are available for warming flat irons, besides which the upper, flat, double griddled top presents additional heating surface for from six to eleven flat irons, according to size. It also has a special advantage for heating water in wash boilers on wash days and for heating preserving kettles in canning time.

The interior of the griddle-top is fitted with deflecting plates which throw the heated smoke and gases from the front around both sides, and out of the smoke outlet at the rear, thus distributing the heat contact with the top as shown in the engraving herewith.



POT SECTION, ALSO SHOWING HEATING SURFACES FOR NINE IRONS

The utmost simplicity is worked into this construction. There are only three parts to connect; very easily set up—requiring but a few minutes' time to put it together and ready for the fire.

TOP WITH GRIDDLES REMOVED, SHOWING BAFFLE PLATES

It can be cleaned of soot in less than a minute.

This heater burns about all varieties of good fuels, but anthracite coal is generally most economical. It requires very little fuel. Proper attention to drafts will bring out best results, from very little coal burning.

The grate is of the rocking and dumping type, and the grate bars of special design favorably regarded by the trade.

A special lug contrivance prevents the accidental dumping of fire as shown in above view.

The dampers and draft doors are few and simple and give absolute control of the combustion.

All heaters are severely tested at our works before shipment.

Any person, no matter how inexperienced, can readily operate them—far less trouble than a stove.

Ash pits are deep and hold plenty of ash deposits, but daily cleaning of the ashes is best.

This heater is made by the American Radiator Co., Chicago, who will quote prices on application.

Blake-Knowles Feed Water Heater

We illustrate herewith the Blake-Knowles Multi-Current Feed Water Heater, manufactured by the Blake-Knowles Steam Pump Works, New York.

In this heater, small tubes with five changes of direction of flow of water produce, not only high velocity, but also a small water core through which the heat must pass.

This is a very important step toward a well-designed heater. Three changes in the direction of flow of the exhaust steam result in the counter-currents of water and steam so essential to the transfer of heat.

This is of the greatest importance as

BLAKE KNOWLES FEED WATER HEATER

the efficiency of the heater depends upon the water and the steam being kept in motion at a certain speed and the tubes being of the size best suited to allow the entire body of water to thoroughly absorb the heat.

Moreover, a heater properly designed may be considerably smaller and therefore both lighter and less expensive than if improperly designed and constructed.

In these heaters the best materials are used, the tubes being made of a composition giving the greatest efficiency in the absorption of the heat, as well as the longest life. The tubes are easily accessible for cleaning and special care has been taken to provide for the expansion and contraction, thus making it possible to use copper or brass tubes as occasion requires. The ends of the tubes are firmly expanded and secured in the two heads, one of which is rigid and part of the main shell casting. The other head is bolted to a copper plate or diaphragm. the periphery of which is attached to the flange of the heater shell. This arrangement takes care of the unequal expansion between the tubes and the shell, and is absolutely reliable and free from strain under all conditions of temperature and pressure.

The tubes are arranged in six nests and the flow of water through them is controlled by partitions in the water chambers at each end of the heater, so that the water will pass through each nest in turn, thus traversing the heater six times. The circulation is positive and the heater is designed to give an even distribution of water, avoiding a sluggish flow or positive stagnation, which often appears in heaters not designed on correct principles. The operation is very simple. The exhaust steam from the engine is thoroughly and evenly distributed by means of partitions in the heater shell and the flow is so diverted as to pass three times through the heater and circulate freely among the tubes. The total absence of stuffing boxes and packings of any kind in this heater does away entirely with the possibility of leakage and loss of feedwater. The cross-sectional area between the tubes is greater than the area of the exhaust pipe, offering no obstruction to the flow of the steam and thus eliminating back pressure. Entrained water is removed by drip pipes.

Access to the heater is had by removing the heads; the tubes of the vertical heaters can be cleaned from the top and the horizontal heaters from either end. Feet or saddles are furnished as occasion requires. Mud-blows are provided to keep the heater clean and free from sediment. Every heater is tested under 250 lbs. pressure per square inch, giving a safe working pressure of 175 lbs. The heaters are made in sizes up to 5,000 H.P. in both the horizontal and vertical types.

Triton Direct-Indirect Radiator

The accompanying illustrations show (Fig. 1.) the Triton three column radiator with box base applied for direct-indirect radiation and (Fig. 2) the box base alone.

In this box base it is easy to control the flow of cold air with unusual accuracy. It will readily be seen that this damper,

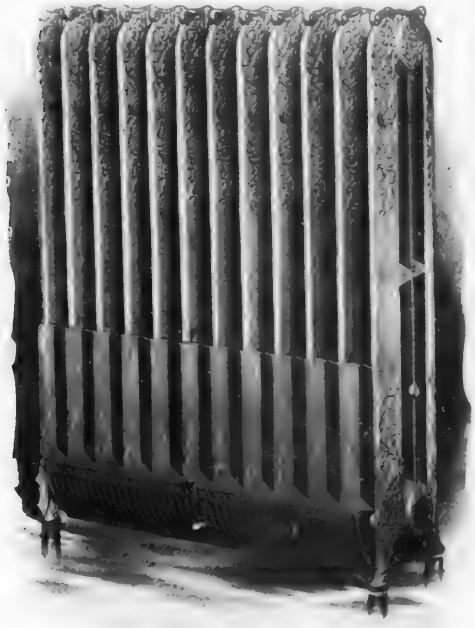
being perfectly balanced, slides around the surface of the box base so as to give any proportion of cold air, mixed with the air of the room, that may be desired.

The damper being a perfect arc of a circle, cold air from outside striking this curved surface is deflected upward instead of striking the front surface, and if the air is taken from the floor of the room it is drawn into the box base and thence upward through the radiator.

Fig. 2. shows the back opening entirely closed. By pushing the damper handle clear down the back opening would be entirely closed and the front opening entirely opened.

If the air is brought through the floor of the box base, it is of course, made without any opening at the back and the damper operates in such a way that no additional floor damper is required.

Another feature is that the flange at the back of the box base is wide enough so that the galvanized iron work can be put in a little further than common and then, if the building settles, there is sufficient margin to prevent any opening between the galvanized iron and the radiator. In this base there is only one bolt,



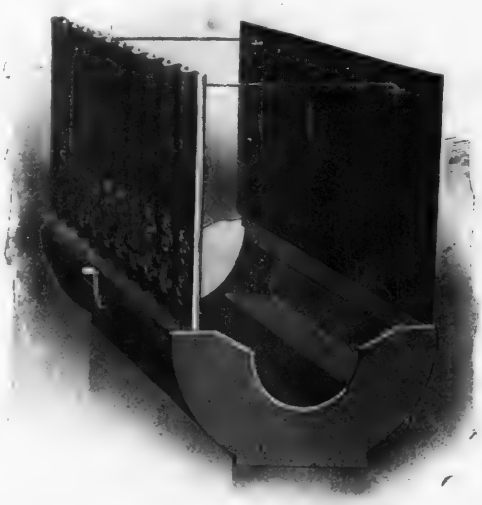
TRITON DIRECT INDIRECT. FIG. 1

and that is not absolutely necessary, but it has been found more convenient to put this bolt in, for example, when putting up a 12-loop base on an 18-loop radiator.

This excellent device has been used in a number of places, and the trade and the house owners express themselves as highly pleased with the result. The Triton line, as all know, is made by the U. S. Radiator Co., Dunkirk, N. Y.

Why the Closed Shop Is Doomed and Why It Is Doomed Now

To confess that a union cannot exist and prosper unless it is able to close the door to all applicants for employment not registered in its membership, says the New York Times, is to admit a fatal and, under present conditions, irremediable weakness in the trades union position.



TRITON DIRECT INDIRECT RADIATOR FIG. 2

The demand is one impossible of recognition by either labor or employers of labor. There has probably never been a time when 15 per cent. of the wage earners of the United States were unionized, and the percentage now in even nominal affiliation is much smaller than this. In very few trades have the unions secured a practical monopoly of the skilled labor. Where they have done so they are entitled to what advantage such monopoly gives them, but this does not include the right to say that if one not a member of their union is employed they will if possible ruin the employer's business. It is borne in upon the intelligent employer that not only his interest but his duty demands that he shall stand for the principle of the open shop, and the calling of strikes to punish him for so doing will only serve to demonstrate to him that any other course would menace them with ruin.

Every such strike must end in the better establishment of the open shop, by compelling employers who have work to do to look outside the unions for men who can do it.

Strikes against the open shop, which means strikes organized to deny employment to non-union men, will result inevitably in transferring from the union to the non-union ranks multitudes of men who want to work and are willing that others in like case shall do the same.

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS

Secretary W. M. Mackay announces the following programme for the summer meeting of the American Society of Heating and Ventilating Engineers at Detroit:

PROGRAM

Friday, July 15

Morning Session—10 o'Clock

Roll Call

President's Address

Paper:

A review of some heating literature (continued) by Hugh J. Barron (member of the society).

Discussion:

Topics for discussion.

No. 1. Are the commercial demands upon the time of our members the only hindrance to the presentation of tabulated or descriptive description of their work?

No. 2. Vacuum systems of steam heating.

No. 3. How and to what extent, if at all, can the effect of humidity upon the sensible temperature of a room be modified by ordinary heating and ventilating apparatus?

The seventh semi-annual meeting being held in Detroit, the home of our president, Andrew Harvey, the city desires to honor both him and that society and a local committee have arranged to entertain the ladies with a drive through Belle Isle Park on Friday afternoon, while the society is in session. They will return in time to meet the members and guests at the foot of Woodward avenue, where a boat will be taken to Bois Blanc Island, where a dinner will be given. The social side will be cultivated until 10 o'clock, the hour for the return sail on the river.

Friday, July 15

Afternoon Session—2 o'Clock

Paper:

The Education of Heating and Ventilating Engineers, by Professor James D. Hoffman (member of the society).

Discussion:

Topics for discussion:

No. 4. Does the practice of consulting engineers, with respect to heating and ventilating matters, admit of uniformity in prices for services, and if so in what direction and to what extent?

No. 5. Has the recent discussion of the Plenum system of heating in England added any new and useful information on this branch or conclusively demonstrated any point?

No. 6. Do the increased benefits of fan over gravity systems offset the operative necessities?

Saturday, July 16

Morning Session—9.50 o'Clock

Paper:

Advanced Methods of Warm Air Heating, by A. O. Jones, Battle Creek, Mich. (non-member of the society), presented by request.

Discussion:

Topics for Discussion:

No. 7. Is it possible to positively change the air in a building a given number of times per hour?

No. 8. Is there any system of heating and ventilating school rooms by means of pressure or exhaust fans, or both, which will not be thrown out of balance by opening windows?

No. 9. Is there a better method of testing the efficiency of a steam radiator than weighing the condensation from it when it is surrounded by air at a stated temperature.

Through the courtesy of T. H. Hinchman, Jr., one of our members, the society is invited to inspect the mechanical and heating plant in the Majestic Building, a Detroit skyscraper, on Saturday afternoon. Those wishing to participate should leave a card with the secretary apprising Mr. Hinchman of their wish, so that he can arrange to meet them.

Many members unfortunately find it impossible to get to Detroit at this time. This is to be regretted. They lose two or three very pleasant days and some profitable intercourse with good men in their own line and the Society loses by every case of absence of a member whose presence would add to the interest and value of the meeting.

It is expected that as many as possible of the eastern members will meet at Buffalo on Thursday and go over to Detroit together on the boat.

Those who wish to travel by day can get to Buffalo by taking the Empire State Express, leaving New York at 8.30 Thursday morning. Excursion tickets can be had for $17 to Niagara Falls or Buffalo and return.

The answers thus far received from members and invited guests indicate the largest attendance at a summer meeting ever known in the history of the society, and of those from the East nearly all will congregate at Buffalo and enjoy the pleasure of a night's sail throughout the length of Lake Erie.

TRADE AND MISCELLANEOUS NOTES

Geo. F. Hall, president of the Geo. F. Hall Company, 211 Centre street, New York, dropped dead on the street, June 8. Mr. Hall was engaged in the heating business for years. He was the father of the Messrs. Hall of the New York Steamfitting Co. whose president, Henry L. Hall, is well known as also president of the National Association of Master Steam and Hot Water Fitters. Mr. Hall was 77 years of age and his residence was in Brooklyn, although he spent most of his time with one of his sons at Stanwood, N. J.

Ernest E. Mann, Detroit, Mich., died June 17 from a stroke of apoplexy at the age of 53. Mr. Mann was a most able and active worker and during the last years of his life was best known by his prominent connection with the radiator business. Having been for years with the Detroit Metal & Heating Works, he went with John B. Dyar when he, in connection with Clarence M. Wooley, organized the Michigan Radiator and Iron Mfg. Co. to make the Perfection radiators. When that company united with others to form the American Radiator Co., Mr. Mann, who had been superintendent, was made assistant manager and held that position until incapacitated by the illness which has now terminated in his death.

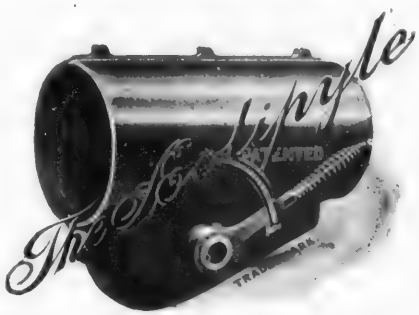
George E. Dixon, a leading Chicago heating contractor, was killed in an automobile accident, June 26. Mrs. Dixon, who was with him, was also killed.

Mr. Dixon's automobile was struck by a trolley car in Austin avenue, by reason either of Mr. Dixon's not seeing the approaching car or having lost control of his machine. It was a gasoline machine and as the tank exploded, the bodies of both Mr. and Mrs. Dixon were badly burned.

Mr. Dixon was president of the Geo. E. Dixon Co., heating contractors of Chi-

THE ÆOLIPYLE

When applied to the Smoke Collar of a Furnace



SAVES Time, Labor, Coal.

PREVENTS Escape of Coal Gas.

GIVES Additional Heat and an even Temperature night and day.

Recommended by Furnace men. Specified by Architects. Adopted by the United States Government.

In use by thousands of individuals, as well as Railroads and School Boards.

Send for illustrated Booklet and Trade Discounts.

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cago, and resided at La Grange. He was a member of the La Grange Country Club and a prominent Mason.

He was a native of Yorkshire, England, where he was educated as a mechanical engineer. He came to the United States in 1881 and went to Chicago in 1885.

James G. Grannis, San Francisco, suffered a sad loss in the death of his five-year-old son, James E. Grannis, who was drowned by falling into a tub of water.

John Demarest, one of the oldest men connected with the J. L. Mott Iron Works, died June 5 in New York at the age of 84. He started as a moulder and became superintendent.

J. S. Brown has a new heating and plumbing establishment on Linden avenue, East Pittsburg, Pa.

J. D. Kane Co., Austin, Texas, have incorporated for the manufacture of steam, gas and plumbing supplies.

Martinsville Plumbing & Heating Co., Martinsville, O., is a recent incorporation.

Kellogg-McCrum-Howell Co. is the latest Kellogg organization. This company is incorporated with a capitalization of $1,500,000 and will take over and carry on the business of the Kellogg-Richmond Co., the Uniontown Acme Radiator Co., and the Penn Enamel Ware Co.

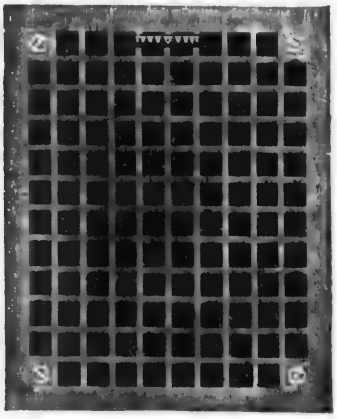
The officers of the company are: President, C. V. Kellogg; first vice-president, Geo. D. Howell; second vice-president, J. L. Furnee; third vice-president, J. E. McGee; treasurer, L. G. McCrum; secretary, H. T. Gates.

The offices of the company have been located at 48 E. 20th street, New York, the old quarters of the Pierce, Butler & Pierce Mfg. Co., next door to the American Radiator Co.

Blight & Engel have started a heating and plumbing business at 410 4th avenue, New York.

St. John and Barnes, steam fitters and plumbers, Colorado Springs, Col., have started a branch at Trinidad, Col.

B. F. Sturtevant Co., Boston, have removed their entire plant from Jamaica Plains to the new works at Hyde Park, where they have nine acres of floor space and all modern appliances.



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CLASS A.
RETURN
TRAP.

The Albany Return Steam Traps

have been the **STANDARD** for over **THIRTY-TWO YEARS.** For returning water under pressure to the boiler, they will perform this duty fully as well, and in many cases better than the so-called steam loop.

Send for circulars A, B, C and D.

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PRESIDENT

JAMES H. BLESSING
GEN. MGR.

Frank C. McLain, well known to the heating trade of New York and the West has the New York agency of the Backus radiator and heater. He has an excellent exhibit at 264 Fourth avenue.

Hollands Mfg. Co., Erie, Pa., have increased their capital stock from $20,000 to $100,000 for the purpose of enlarging their plant for the manufacture of vises and other tools.

Des Lauriers & Chapput are a new heating and plumbing concern at 222 Remsen street, Cohoes, N. Y.

H. B. Carter succeeds O. S. Densmore in the heating and plumbing business at Springfield, Vt.

Coast Sanitary & Heating Co., W. A. Eberhart manager, is a new concern at 1004 W. Fifth avenue, Asbury Park, N. J.

Ivey & Anderson are a new heating and plumbing firm, 106 S. Union street, Danville, Va.

Myole & Cummings have started a heating and plumbing business at 64 Main street, Salt Lake City, Utah.

Prudential Heating Co. is a new concern at Akron, O.

C. Chambers has opened a heating and plumbing shop at 309 S. George street, York, Pa.

W. A. Russell & Co., whose main office was formerly in New York, but has been for the last four years in Detroit, have returned to the East. This has been made necessary by an increased demand for the Russell floor and ceiling plates and automatic air valves, requiring the presence of Mr. Russell near the factory. His many New York friends will welcome him back, and presumably his western friends will continue to send him their orders.

John Plaxton Co., Ltd., succeed the Dominion Steam Heating Co., Winnipeg, Manitoba.

Geo. P. McCullum has bought out the Taylor Plumbing and Heating Co., Muskegon, Mich.

Cambria Plumbing & Heating Co., Johnstown, Pa., is a new organization.

John Roth has started a heating and plumbing business at Mitchell, South Dakota.

Wm. F. Latimer has started in the heating and plumbing business at Clinton, N. J.

20th Century Heating & Ventilating Co., 524 S. Adams street, Peoria, Ill., is a branch of the concern of the same name at Akron, O.

Fentzlaff Heating Co., is a new incorporation at Montclair, N. J.

The Sunray Steam Boilers

AND WATER HEATERS

are made in over **ONE HUNDRED SIZES,** from 150 to 9,000 feet steam, and from 150 to 15,000 feet water. Factories at New York and Pittsburg. .·. .·.

GET OUR LATEST PRICES

THE J. L. MOTT IRON WORKS

84-90 BEEKMAN STREET **NEW YORK, N. Y.**

McAllister & Champion, 90 Gorton avenue, Cortland, N. Y., are a new heating and plumbing concern.

Sheldon & Sheldon succeed the McEachren Heating and Plumbing Co., Galt, Ont.

C. A. Hardwick succeeds to the heating and plumbing business of Hardwick & Streeter, 20 Bishop street, Waterbury, Conn.

Albert Kunzelman succeeds his father, C. C. Kunzelman, in the heating and plumbing business at New London, Conn.

A new line of centrifugal blowers is being put upon the market by the Niagara Radiator Co. in order to extend the scope of their line of heating apparatus.

Vanderman Plumbing & Heating Co., Willimantic, Conn., again impress upon the trade the value of their tool chest for carrying steamfitters' tools.

Warren Webster & Co., of Camden, New Jersey, have recently commenced two suits for infringement of their patents on the Webster System and specialties.

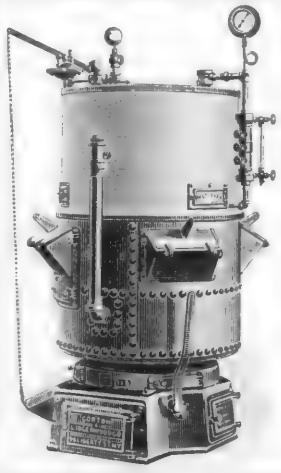
One of these is in the northern district of Illinois against the Consolidated Engineering Company, of Chicago, to restrain further installation by that company of "Consolidated Systems" in infringement of the Webster System patents.

The other suit is in the southern district of New York against Julius S. Ehrich, the proprietor of Ehrich Brothers department store, for damages and an injunction on account of the use of "PaKin" valves.

Kewanee Boiler Co., Kewanee, Ill., have placed upon the market a steam and hot water Haxton boiler, made of wrought iron and steel. It is designed to meet the requirements of localities where coal is used containing a high percentage of sulphur, which acts upon the steel in a way to shorten the life of the boiler. The introduction of iron overcomes this difficulty.

American Radiator Co., Chicago, are about erecting a warehouse at Wharton and 25th streets, Philadelphia. It will be of brick and 130x200 feet, two stories.

The Henry R. Worthington Hydraulic Works, at the corner of Rapelyea and Van Buren streets, Brooklyn, are shortly to be removed to Harrison, N. J., to occupy the new $2,000,000 plant of the International Steam Pump Co. now nearly completed. About 2,000 men are employed in the South Brooklyn Works and many



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BOILERS
FOR STEAM AND HOT WATER HEATING

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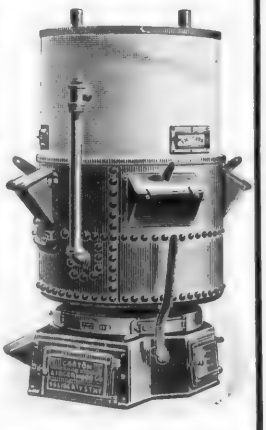


HEATING and VENTILATING BUILDINGS

Prof. R. C. Carpenter's standard work; latest edition; 577 pages, 277 cuts. **Price $4.00.**

HEATING AND VENTILATING MAGAZINE
1123 Broadway, New York

will undoubtedly go to the new plant at Harrison, which will accommodate from 5,000 to 6,000 men. The Brooklyn works will probably be sold, the company having already disposed of its large foundries at Elizabethport, N. J.

Richard T. Crane, Jr., second vice-president of the Crane Co., Chicago, was married to Miss Florence Higginbotham, June 4, by Bishop Anderson.

William Grier has arranged to represent the new Kellogg-McCrum-Howell Co., in New England territory, which he has previously covered for years in the interest of J. L. Mott Iron Works.

George O. Greenman will remove from the Norwich office to New York, representing the company in the Metropolitan district.

Geo. T. Coppins, of Walworth Mfg. Co., Boston, has been re-elected vice-president for Massachusetts of the National Association of Manufacturers.

H. E. Adams, well known to the trade in the East as president of the Adams, Jones Co., of Boston, and well known in the West as treasurer of the Ideal Boiler Co., has been appointed assistant treasurer of the American Radiator Co. We congratulate both parties. The company have an excellent man, and the man has an excellent position.

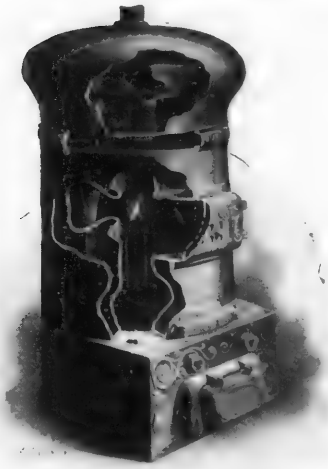
James J. McDonald has applied for an accounting and the appointment of a receiver for the Western Paul Steam System Co. on the ground that they have, as he claims, illegally transferred business and privileges to a New York corporation.

A few installations of Wall radiation are shown in a small but beautifully printed pamphlet of the Fowler & Wolfe Mfg. Co., The Bourse, Philadelphia. An interesting feature of the booklet is the showing of extraordinary and ingenious applications of this radiation to difficult conditions.

Crawford boilers for steam and hot water are the subject of a catalogue which we have received with the compliments of John A. Fish, of the Walker & Pratt Mfg. Co., 31 Union street, Boston. "Honest ratings" is the strong line on the front page and those who know the boilers will agree that not only are the ratings honest but the workmanship is more than honest; it is superlative. Copies of the catalogue may be had on application to the manufacturers.

Thatcher Furnace Co., 240 Water street, New York, send us their latest price list and discount sheet of Thatcher steam and hot water heaters, radiators and specialties. They are now making these goods in a variety of styles and sizes calculated to meet any requirement.

Thatcher Comfort Steam and Hot Water Heaters.



Look at the interior construction of the Dome.

You can see at a glance how the products of combustion are retarded until all the heat units have been extracted.

This not only means fuel economy, but what is as important, the Dome makes a perfect super-heater, and nothing but absolutely dry steam is delivered to the radiation.

A Steam Heater, Range or Furnace that bears the "*Thatcher*" name-plate will bring sales and pleased customers to any fitter who handles them.

Thatcher Furnace Company

Works: Newark, N. J. **240 Water Street, New York**

U. S. Heater Co., Detroit, Mich., issue a new catalogue which contains the Capitol, Jr., tank heater for supplying hot water for domestic service.

Burley Heater Co., Tyrone, Pa., send out a handsome catalogue of their steam and hot water heaters.

These boilers have a good range of capacity, are well made and have seen several years' service.

Model Heating Co., Philadelphia, send out, as Volume 62, of their free library, a little folder entitled "Drafts and how to doctor them." In view of the many difficulties with chimneys and drafts this cannot fail to be of value.

The Engineering Times, England, has changed from a monthly to a weekly, and hereafter will appear as a newspaper of engineering and trade, its publication in magazine form having ceased.

James B. Clow & Sons, Chicago, issue a circular descriptive of the Clow improved portable pipe machine.

Economy Dies are described in a little catalogue issued by the manufacturers, F. E. Wells & Son Co., Greenfield, Mass.

"Oil vs. Grease" is the title of a recent pamphlet sent out by the Joseph Dixon Crucible Co., Jersey City, N. J.

A. Harvey's Sons Mfg. Co., Detroit, issue a descriptive book of brass and iron body gate valves.

Henderson Heaters, made by the Prizer-Painter Stove & Heater Co., Reading, Pa., are boomed by them in a small leaflet devoted particularly to their New York city business, giving the names of many users in this vicinity.

Fred D. Johnson Co., 30 E. 20th street, New York, issue a vest-pocket price list of "Argand" boilers.

Low-Service Compressors for Air and Carbonic-Acid Gas, is a 12-page pamphlet, published by the Laidlaw-Dunn-Gordon Co., New York, describing compressors intended for pressures of 30 lbs. and under. These compressors are built with open suction for supplying air at low-pressure, or with closed suction for handling carbonic-acid and other gases. The inlet valves are of the semi-rotary type, while the outlet valves are of the poppet type. Rotary valves are considered superior for inlet service, not only because of their greater efficiency and durability, but furthermore because they open promptly and offer no resistance to the incoming air, which the poppet valve held down by a spring must necessarily do, thus cutting down the volume capacity of the compressor. The discharging valves, on the other hand, present a different problem owing to the fact that the point of opening should vary with variations in pressure, and the poppet type has been adapted for this service.

CENTRAL STATION HEATING

We are the originators and builders of the underground system of live and exhaust steam heating. Our system is used for the utilization and distribution of exhaust steam from electric and power plants for heating purposes. 250 plants in successful operation. We have the only Meter System. Also manufacturers of Wooden Water Pipe, Steam Pipe Casing, Steam Traps, Condensation Meters, Valves, Economizing Coils, Separators and full line of Steam Fitters' Supplies. Write for Pamphlet and Price List. Mention Heating and Ventilating Magazine.

American District Steam Co.

Lockport, N. Y. **Chicago, Ill.**

ELMO AIR VALVES

AUTOMATIC FLOAT **LOCK SHIELD AUTOMATIC FLOAT**

First class, high grade goods. Close by flotation and expansion. Many special features of excellence which will be readily appreciated : : :

PHELPS BROTHERS

210 Water Street **New York**

American Blower Co., Detroit, have compiled a small and very beautiful booklet briefly describing their varied lines of apparatus, giving just enough information to make one wish for and presumably ask for more.

Regenerated Cold Air Co., 147 Milk street, Boston, issue a special book devoted to the confectionery business. The frontispiece shows the interior of the confectionery store of the Walter Lowney Co., 416 Washington street, Boston, which is cooled by the Regenerated Cold Air Co. A disquisition on it is printed from the description of the Confectionery Co., following it is what is consisted in a cold air regenerator. The book will be of interest to all heating and ventilating engineers.

A great grate is what Donegan & Swift, 6 Murray street, New York, call the Swift Imperial Clinker-crushing Shaking Gratebar. The large pictures of the bar in their circular seem to indicate that they have an exceptionally good thing and an accompanying blueprint gives in detail the results of a test of this grate on a 150-horsepower boiler at the Mt. Prospect Pumping Station, Brooklyn. The test was conducted by Reginald Pelham Bolton, the New York consulting engineer, and on one day the recorded efficiency is 77 28-100.

Pittsburg Valve & Fittings Co. send out their catalogue B, including a number of new articles.

Cooling and moistening air in cotton mills is described in a pamphlet sent out by the Regenerated Cold Air Co., 147 Milk street, Boston.

Urie Boiler & Machinery Co., Kansas City, Mo., issue a 28-page catalogue describing their line of steel boilers for heating service, ranging from 20 to 36 inch grates.

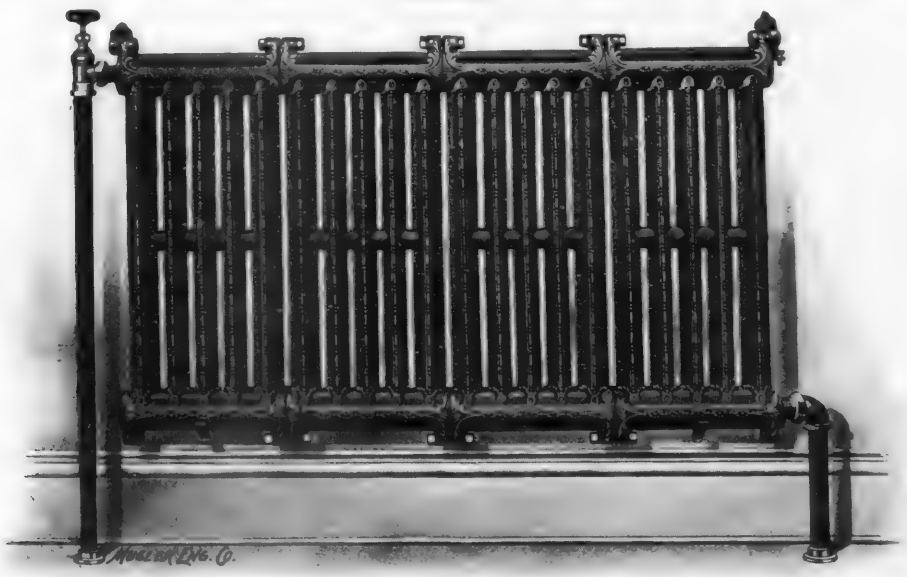
Hall Patent Pipe Reamers are advertised by the Walworth Mfg. Co., Boston, in a little folder sent out in their mail. The reaming of pipes is important in good work, and the Hall reamer is an excellent tool for the purpose.

"Manchester Midland Hotel: A problem and its solution," is the name of an exceedingly handsome book describing the heating apparatus installed in a very American kind of hotel at Manchester, England. The book comes to us with the compliments of the heating and ventilating contractors, Ashwell & Nesbit, Ltd., London and Leicester.

Thatcher Furnace Co., 240 Water street, New York, send us a small pocket price list of Thatcher steam and hot water heaters, radiators and specialties.

"Novus" Wall Radiator

PATENTED



Slip Nipple Connections Consequent freedom from leaks when many sections are combined in one radiator. Easily assembled without special tools. **Artistic in Appearance**

National Radiator Company, Johnstown, Penn.

They mention that they are making these goods in a variety of styles and sizes to meet all requirements, and as their manufacturing facilities have been greatly increased they are in a position to make prompt shipments.

Heating Contracts

Gillis & Geoghegan, 537 West Broadway, New York city, heating store and loft building, 534 Fifth avenue.

A. Wilfert, 490 Bushwick avenue, Brooklyn, heating store, Broadway and Greene avenue.

Buckingham & Routh Co., 79 Court street, New Haven, Conn., heating National New Haven Bank.

Mills & Brown, East Orange, N. J., steam heating Saxum store and flats, Sterling street and Ninth avenue.

John J. Kaveny, Montclair, N. J., heating N. P. Nelson's residence, Midland avenue.

L. G. Kirk, 419 Lexington avenue, New York, heating "Fango" institute, 69-71 W. 50th street.

Reisinger, Prather & Co., Pittsburg, Pa., plumbing, heating and lighting Rockefeller building, Cleveland, O.

Walker & Chambers, 50 East 20th street, New York, heating dormitories "A" and "B" Columbia university.

Rossman & Bracken Co., 132 East 42d street, New York, heating public bath, East 76th street.

Leslie J. White, 50 South Washington Square, N. Y., heating large apartment house, West 111th street.

Blake & Williams, 211 West 20th street, New York, heating Baltimore Stock Exchange Building, Baltimore, Md.

H. E. Wieber, 28 East 20th street, New York, heating bachelor apartments, Henry street, Brooklyn.

Wells & Newton Co., 17th street and Avenue B, heating Chas. T. Yerkes residence, Fifth avenue.

M. Weil, Mott Haven, New York city, heating store and residence, 2500 Amsterdam avenue.

Mulhern Steam Heating Co., 401 West 59th street, New York, heating four apartment houses, 158th street and Brook avenue; heating Morello restaurant, West 38th street.

P. C. Dougherty, 1875 Atlantic avenue, Brooklyn, N. Y., heating St. John's Evangelist Church, Brooklyn.

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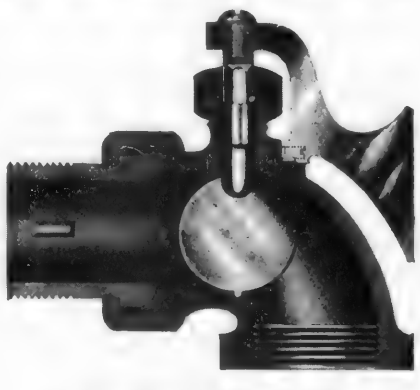

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30 Portland Street, - BOSTON.

Fentzlaff Heating Co., Montclair, N. J., heating Rufus B. Cowing, Jr., residence, Glen Ridge.

Frank R. Schroeder, Grand street, Jersey City, N. J., heating double flat, Eighth street.

Julius Wagnor, Jr., Newark, N. J., heating E. Eyrick residence, Joliff avenue.

Mills & Brown, East Orange, N. J., heating Eagles residence.

A. A. Sanborn, Boston, heating State House, Columbia, S. C.

New York Steamfitting Co., New York, heating Butler Bros.' eight-story warehouse, Jersey City.

J. Borden & Bro., Philadelphia, heating new Century Club.

James S. Kelly, Greensburg, Pa., heating Turtle Creek school.

E. G. Whiteacre Boiler Co., Wellsville, O., hot water heating People's National Bank.

Johnson & Morris, 30 W. 13th street, New York, heating Chesapeake & Potomac Telephone Co.'s building, Baltimore, Md.

George J. Wallace, 206 E. 57th street, New York, hot water heating St. Mary's Hospital, Jamaica, L. I.

Baker, Smith & Co., 83 W. Houston street, New York, heating 69th Regiment Armory; heating Winthrop Rutherford residence, Allamuthy, N. J.; heating Miss Leary's residence, 1032 Fifth avenue; heating E. W. Humphrey's residence, E. 38th street; heating E. Holbrook residence, E. 52d street.

The Sayles Co., 446 Fourth avenue, New York, heating Harley T. Proctor's residence, 11 E. 52d street.

Charles Snyder, 3196 Third avenue, New York, heating six apartments, Prospect avenue, Bronx.

James Curran Manufacturing Co., heating school and library General Society of Merchants and Tradesmen of New York, 16 W. 44th street.

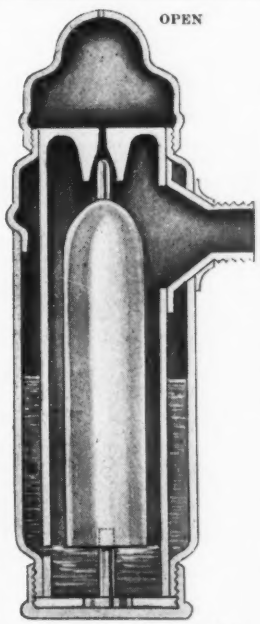
Empire Heating Co., 4177 Third avenue, New York, heating Matilda Frehan flats, East 50th street.

Gillis & Geoghegan, heating four residences, E. 50th street; heating private school East 77th street; heating three residences East 52d street.

Drummond & Co., Newark, N. J., heating store 85 Market street.

L. R. Williams Co., 129 Beekman street, New York city, heating 8-family apartment house, Union street, Brooklyn; heating large apartment house, 8th street and Eighth avenue, Brooklyn.

NEWEST OF THE NEW



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G. H. Weymouth & Co., 259 Front street, New York city, heating 39th Precinct Police Station and stable, White Plains Road, Bronx.

James Curran Mfg. Co., 512 West 36th street, New York city, heating William H. Seaich stable, 142 East 31st street.

Henry J. Yockel, 51 East 99th street, New York city, heating large flats, 159-163 West 103d street.

Frederick Faas, Montclair, N. J., heating Miss Mary B. Taylor's residence.

Henry Lipkemann, Ridgefield Park, N. J., heating W. J. Morrison, Jr., residence.

Harrison & Walker, East Orange, N. J., heating Philip Kull residence, Newark.

Storms & Co., Newark, N. J., heating two-family residence, Woodside avenue.

Momier & Mahoney, Biddeford, Me., heating new convent of St. Andrews parish.

Robbins, Gamwell & Company, Pittsfield, Mass., heating and ventilating new Orchard street school building.

O'Toole Bros., Clinton, Mass., heating Union House at Ayer.

G. S. Blodgett Company, Burlington, Vt., heating new Archibald street school building.

Lane-Bowen Company, Lorain, O., heating three new school buildings.

F. D. Leighton, Manchester, N. H., heating Rimmon school at McGregorville.

Lewis & Kitchen, Kansas City, Mo., heating manual training and high schools of Topeka, Kas.

P. J. McGuire, White Plains, N. Y., heating James G. Cannon residence, Scarsdale, N. Y.

McKenna Bros., Westbury, L. I., heating Wm. K. Vanderbilt, Jr., poultry-building, Great Neck, L. I.

Wm. McGonigal, Mt. Vernon, N. Y., heating Dominick Smith residence, Pelham Heights, N. Y.; Chas. Smith residence, Manor Heights, N. Y.

George Siltz, Portchester, N. Y., heating E. W. Simons residence.

G. A. Swalm & Son, Middletown, N. Y., heating Wickham avenue station.

Roys Steam Heating Co., 1010 Gates avenue, Brooklyn, N. Y., heating Memorial M. E. Church, White Plains, N. Y.; heating stores and offices 96 Warren street, New York.

John Boyd, 151 West 68th street, New York, heating M. Maxwell apartment house, Yonkers, N. Y.

Valentine Bros., New Rochelle, N. Y., heating Wm. H. Matthews residence.

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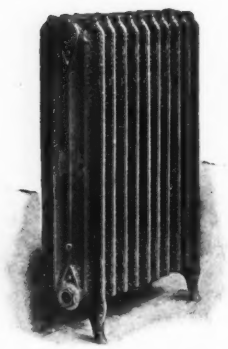

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Young & Hughes, Raleigh, N. C., heating residence for Dr. Harris at Franklin, N. C.

Channon, Perry & Company, Rock Island, Ill., heating new roundhouse of Rock Island Railway at St. Louis.

C. C. Shipman, Orange, N. J., heating Martin D. Deignan residence.

Elias Berla, Newark, N. J., heating Insane Asylum, Overbrook, N. J.

George J. Tobin, Plainfield, N. J., heating Clifton Wharton residence.

M. Heck, Prospect avenue, Bronx, New York, heating four flats, 150th street and Beach avenue.

Seward Engineering Co., 89 Centre street, New York, heating Concourse Park Hotel, Ocean Parkway, Brooklyn, N. Y.

G. & R. Heepe, 451 Seventh avenue, Brooklyn, N. Y., heating apartment house 14th street and Prospect Park West.

Storms & Co., Newark, N. J., steam heating 13th ward school; steam heating J. N. Young residence, South 7th street.

Jaehnig & Peoples, Newark, N. J., heating double flats, West Kinney street.

S. Faith Co., 2427 Pennsylvania avenue, Philadelphia, steam heating George Eastman's residence, Rochester, N. Y.

United Heating Co., 174 Wooster street, New York, high and low pressure work in the Imperial Turkish baths.

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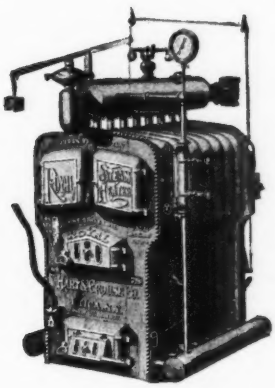

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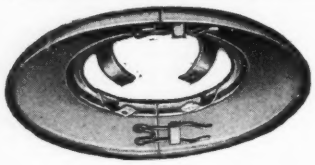
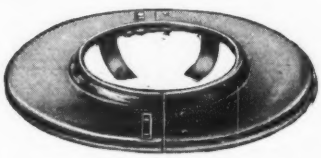
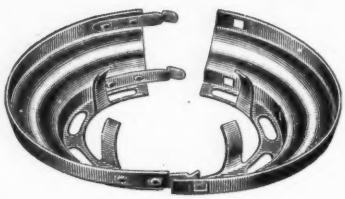
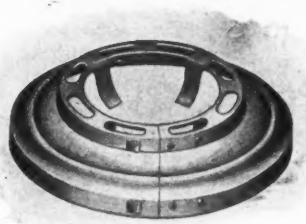

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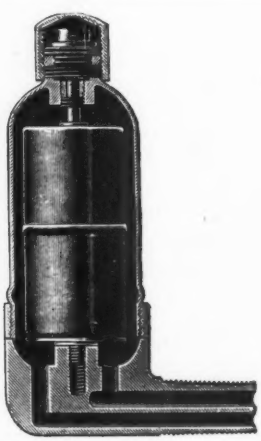

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